International Tundra Experiment, Barrow, Alaska

Plant and Physical Responses Under Open-Top Chambers of Dry Tundra

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International Tundra Experiment, Barrow, Alaska:

Plant and Physical Responses Under Open-Top Chambers of Dry Tundra, 1995

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List of figures, tables, and appendices

List of figures

List of tables

List of appendices

Abstract

The standard open-top chamber manipulation of the International Tundra Experiment continued at Barrow, Alaska during the summer of 1995. The monitoring of the two ITEX species *Cassiope tetragona* and *Salix rotundifolia*, in addition to 25 species was continued in the 1994-site, and a new site was established in the nearby marsh with the same design focusing on the ITEX species *Carex aquatilis* ssp. *stans* and *Eriophorum angustifolium* ssp. *triste*. In addition, all other vascular species occurring in the Meadow site were monitored. In 1995, the instrumentation of the experiment was expanded. Temperature data loggers were installed in two thirds of the plots in both sites and a few humidity data loggers were set up at the Ridge site. In 1995, the shielding of the thermistors of the temperature data loggers was improved. A comparison of the new shields with the previous type was made. In addition, an experiment was carried out to document the vertical and horizontal temperature variation in the open-top chambers. A clip harvesting experiment was initiated at the Ridge site, studying how a temperature enhancement influences the biomass production. Detailed vegetation analyses of the species composition of vascular plants and cryptogams of the Ridge plots was made and the depth of thaw was measured during the entire growth season.

Although the mean summer temperature in 1995 was 1.6° C lower than in 1994 the warming effect of the OTC's was similar each year, c. 1.7° C.

The cold summer affected the monitoring of *Cassiope tetragona* and only very few flowers emerged in the control plots while the number of flowers in the OTC's was smaller than last year, hence no continuing. No effect was seen as in high arctic Canada where the number of flowers increased significantly after the first summer of temperature manipulations.

The difference between experimental and control plots in annual growth increment of + 0.5 cm was just barely significant. Although this difference is the same as the preceding summer the growth was much smaller in 1995 presumably because of the cold summer. Compared to 1994 the growing season of female *Salix rotundifolia* started 5-9 days earlier this year in both types of plots, whereas the onset of seed dispersal is 9 days later in OTC's and 2 days in controls this year. There is no difference in the length of the growing season between OTC's and controls this year. In 1994 OTC's started 5 days earlier and controls 9 days earlier. Differences in length and weight of the leaves are the only measures that show significant differences between plants in experimental and control plots. The difference (1.8 mm) in length of the longest leaf is significantly bigger in OTC´s as in leaf weight (1.6 mg). Like the females the flowering of male *Salix rotundifolia* started earlier this summer. The onset of dispersal of pollen and the time of all pollen released were highly significant earlier in the OTC's. The period of pollen release is only slightly longer (c. 10%) in the experimental plots, which contrasts a 34% longer period in 1994.

1. Introduction

ITEX is an international botanical project designed to simulate the responses of arctic plants to the predicted global warming. In more than 20 sites in the circumpolar Arctic (Fig. 1) monitoring of selected vascular plant species mostly with a circumpolar distribution are carried out. The Barrow site joined the program in 1994, and the results from this work is presented in Bay (1995). This report presents the results from the work carried out during the summer 1995 for the Ridge site and describes the establishment of a new wet Meadow site.

Climatologists predict that the greatest increase in surface air temperature as a consequence of increasing emission of greenhouse gases will appear in the polar regions during the next decades. In order to simulate this event in small scale and to study the responses of arctic plants to enhanced summer air temperature, manipulations were conducted by using plexiglass open-top chambers (OTC's) around selected plants. As a result of this the temperature within the chambers increases 1-2° C (Marion et al. 1993, Bay 1995), which corresponds to the predicted effect on air temperature of the global warming.

This report deals with the results from the Ridge site, and the description of the establishment and methods used in the new Meadow site. Some results from this site were presented at the 7th ITEX workshop in Copenhagen in 1996 (Hollister et al. 1996a, 1996b, Walker et al. 1996). The results of the monitoring of *Salix rotundifolia* is part of a joint paper (Jones et al. in press).

During the summers 1994 and 1995 phenological monitoring was carried out mostly on a daily basis during the entire growing season from mid June to the end of August on selected individuals of the two ITEX species *Cassiope tetragona* and *Salix rotundifolia*. The experiment was extended in 1995 by establishing another site in a wet marsh with two other ITEX species: *Carex aquatilis* ssp. *stans* and *Eriophorum angustifolium* ssp. *triste*. The set-up of the Meadow experiment and the monitoring followed basically the same methods as for the Ridge site.

During the past summer detailed analyses of the composition of the vegetation and the frequency of the species were made at the beach Ridge site in order to follow the changes in the composition of the plant communities over time.

An experiment to document the vertical and horizontal variation of the air temperature was conducted.

The project has been financially supported by the U.S. Arctic System Science program of the National Science Foundation (Grant OPP-9318528).

2. Study sites

2.1. Establishment of sites

2.1.1. The Ridge site

The site on the beach Ridge north-east of Barrow (Fig. 2) was re-established on June 14, four days earlier than the establishment of the site in 1994 (Bay 1995). Except for six of the plots in the northern end of the site, all plots were snow free by the inspection on June 13, resulting in snow conditions and the onset of the growth of the vegetation very similar to the situation in 1994.

2.1.2. The Meadow site

A new ITEX site was established on June 25, in a wet marsh area in the Central Marsh just west of the beach Ridge. It is approximately 300 m south of the Ridge site within the ARCSS grid (Fig. 2). The new site, the Meadow site, stretches 200 m southwards parallel to the Ridge. The north end is close to the grid pole with the co-ordinates 7913700N, 586000E, and grid pole 7913500N, 586000E is towards the southern part of the site approximately 30 m west of the last plots (Fig. 3).

At the three poles closest to the site the snow depth, measured by Barrow Technical Services, in April 1995 was 80, 70, and 34 cm, respectively. The snow depth on the plots in the southern part of the site is about 50 cm judging from the snow map by Hinkel (1995). 48 potential plots with the key species *Carex aquatilis* ssp. *stans* and *Eriophorum angustifolium* ssp. *triste* were selected in an area 1-6 m from the snow bank. The area had only been snow free for few days judging from the speed of the melt off of the remaining snow bank. 24 control plots and 24 experimental plots of the same type as used at the Ridge site (see Fig. 2 in Bay 1995) were set up randomly. They lie more or less in a SSE line. The order of the plots is given in Appendix 1. A path on the west side of the plots was used in the daily work in order to minimise the impact to the vegetation caused by walking close to the plots (Fig. 4).

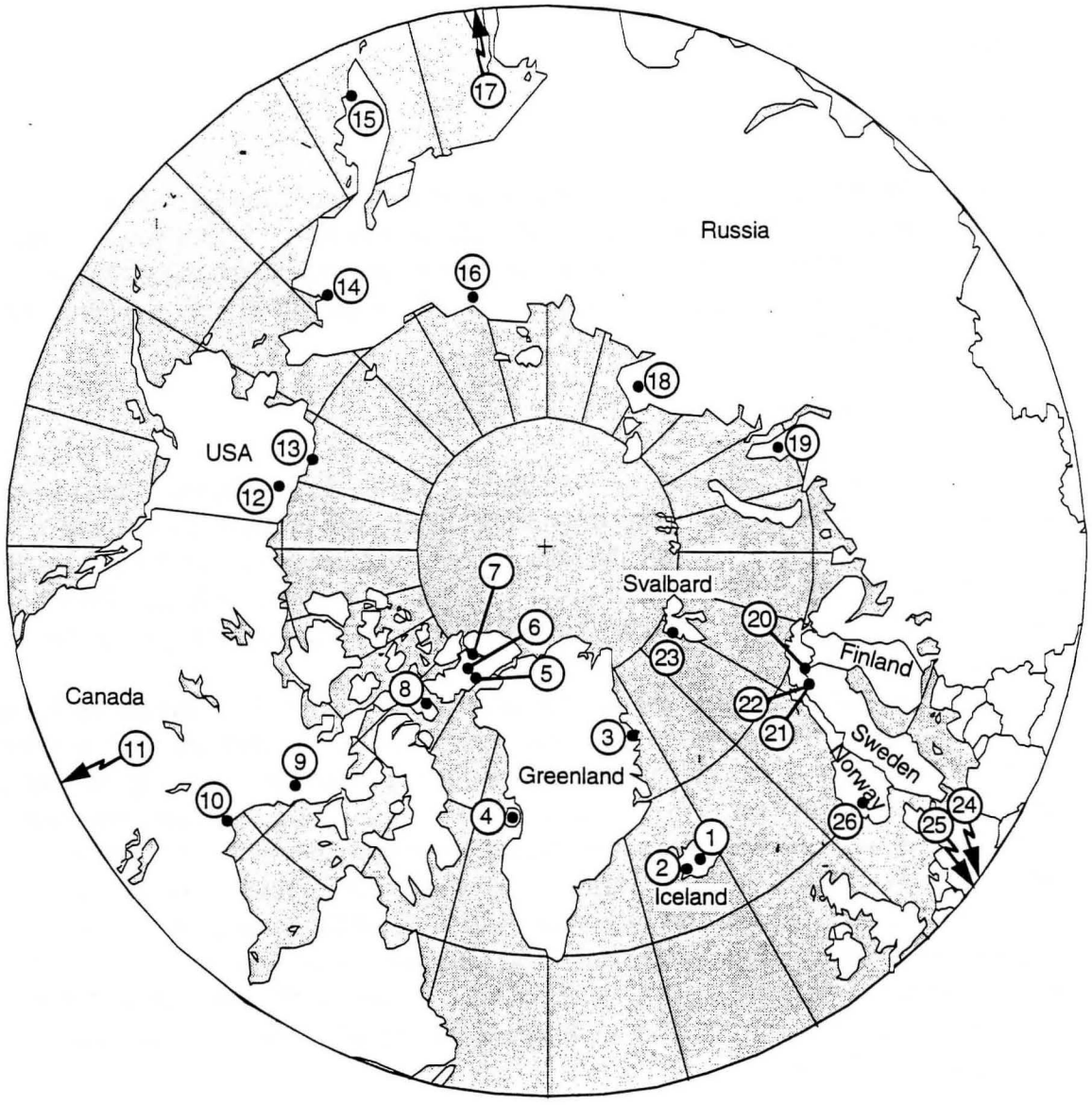
2.2. Description of the vegetation

2.2.1. The Ridge site

The vegetation of the Ridge site is described by Bay (1995). The total number of vascular plant species is 27 (Appendix 2) and about 30 species of bryophytes and 30 species of lichens have been identified (Appendix 3).

2.2.2. The Meadow site

The vegetation in the wet marsh is a homogeneous graminoid vegetation dominated by *Carex aquatilis* Wahlb. ssp. *stans* (Drej.) Hult. (syn.: *Carex aquatilis* ssp. *stans* Drej.),



1 Hveravellir, Iceland
2 Mt. Skálafell, Iceland
3 Zachenberg, Greenland
4 Disko Island, Greenland
5 Alexandra Fjord, Canada
6 Sverdrup Pass, Canada
7 Hot Weather Creek, Canada
8 Truelove Lowland, Canada
9 Baker Lake, Canada
10 Churchill, Canada
11 Niwot Ridge, USA
12 Toolik Lake, USA
13 Barrow, USA
14 Anadyr, Russia
15 Petropavlovsk, Russia
16 Lower Kolyma, Russia
17 Taisetsu Mts., Japan
18 Taimyr, Russia
19 Yamal, Russia
20 Kilpisjärvi, Finland
21 Abisko, Sweden
22 Latnjajaure, Sweden
23 Ny-Ålesund, Svalbard
24 Val Bercla, Switzerland
25 Furka Pass, Switzerland
26 Finse, Norway

Fig. 1. ITEX sites in the circumpolar Arctic. After Marion (in press).

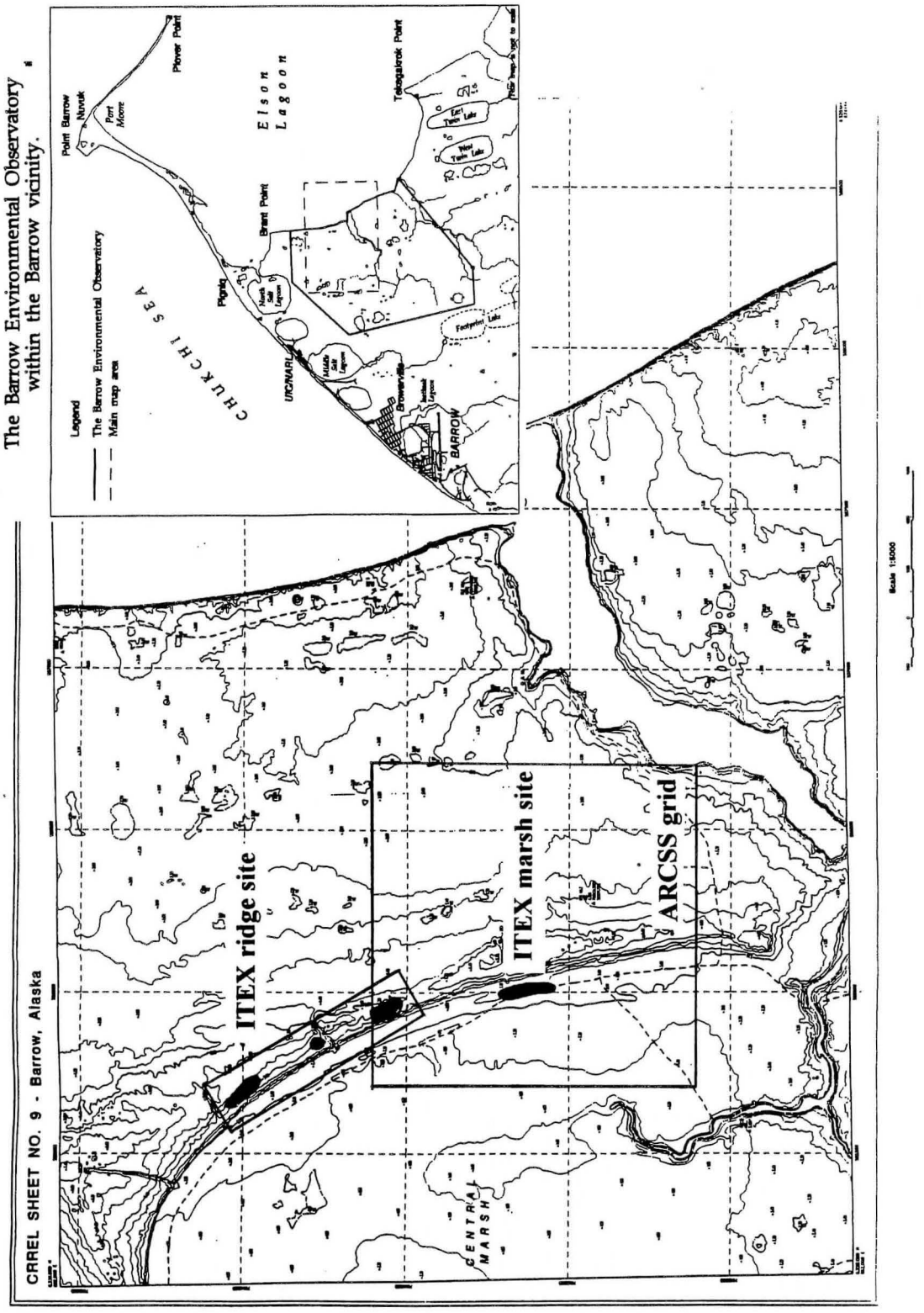


Fig. 2. The location of the two ITEX sites and the ARCSS grid within Barrow Environmental Observatory. The map is a section of CRREL Sheet No 9, Barrow, Alaska created in 1965 by Cold Regions Research and Engineering Laboratory, Hanover, N.H. and digitised by the North Slope Borough GIS Department.

Dupontia fisheri R. Br. ssp. *fisheri*, and *Saxifraga cernua* L.

Other important species are: *E. angustifolium* Honck. ssp *triste* (Th. Fr.) Hult. (syn.: *Eriophorum triste* (Th. Fr.) Hadac & Löve), *Saxifraga foliolosa* R. Br., *S. hieracifolia* Waldst. & Kit., *S. hirculus* L., *Cardamine pratensis* L., *Stellaria laeta* Richards., and *Draba lactea* Adams. All species are given in Appendix 4.

3. Temperature recording

3.1. The Ridge site

The temperature data loggers at the Ridge site were deployed differently in 1995 than in the previous year (Bay 1995). The type and number of data loggers were altered, the frequency of recordings was increased, and the thermistors had improved shields. StowAway data loggers, recorded every 16 minutes during a period of 88 days, were installed in 18 OTC's, and in 18 controls. The plots for the data loggers were randomly selected among the 48 plots (Appendix 5). The data loggers were placed in a sealed plastic box placed outside the plots. The thermistors were protected in plastic tubes. The thermistors were placed in Gill six-plate radiation shields on stakes in the northern part of the OTC's, and in the north-eastern corner of the control plots approximately 15 cm above the vegetation. The data loggers were programmed to start simultaneously on June 19 at 18:00. All dataloggers were taken down August 22 after 14:00.

Fig. 3. The Meadow site just after snowmelt in June, seen from north.

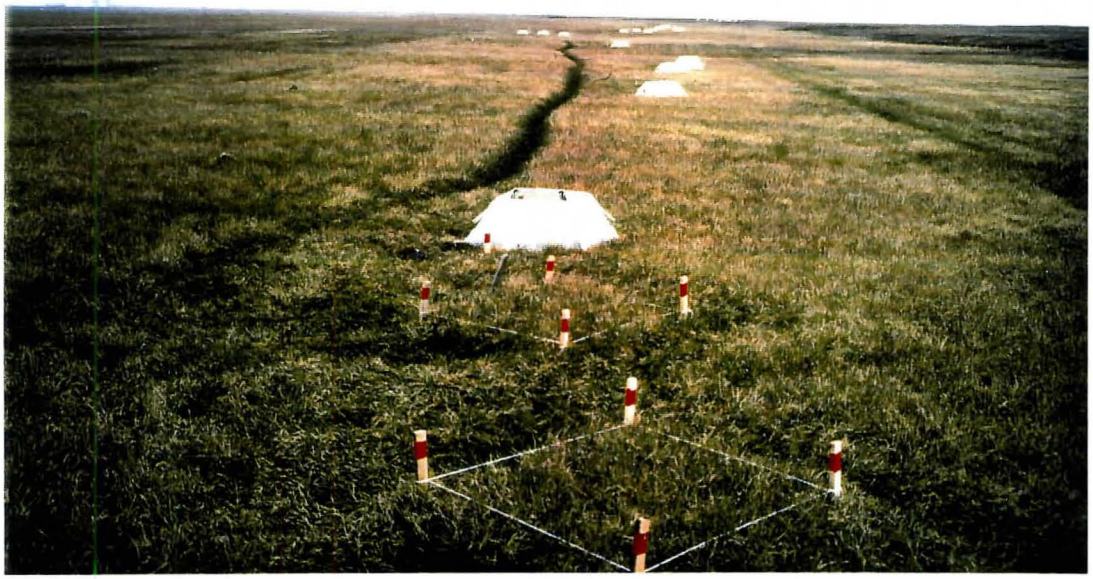


Fig. 4. The Meadow site in August seen from south. The path was used when moving around the site.

For the comparison of the temperature data from 1994, when Styrofoam beverage cups were used as shields, one Hobo data logger was installed in a Styrofoam cup and placed by a control plot on July 25.

3.2. The Meadow site

26 temperature data loggers were installed on July 5; they operated for 7 weeks. The plots for the data loggers were selected randomly. The shields were placed on the stake in the north-east corner of the controls and on a stake in the northern part of the OTC's in order to minimise the negative shading effect. An additional 8 temperature loggers were deployed from July 6 until August 22.

4. Humidity recording

4.1. The Ridge site

10 Hobo humidity data loggers were installed at the Ridge site on June 22 in plots randomly selected (Appendix 5). They recorded every 1.2 hours during a period of 90 days. The data loggers were placed up-side down in Styrofoam cups with a cap formed by a plastic bag and fixed to wooden stakes. The sensors were exposed to the air in the centre of the cup. The data loggers were taken down August 22.

4.2. The Meadow site

No humidity loggers were installed, as they were delivered in mid-August leaving a too short period for recording.

5. Probing of the active layer

The method of probing the depth of the active layer was slightly modified from that of the ITEX manual (Nelson *et al.* 1995). Experimental and control plots were probed every day for the first two weeks starting from one day following the onset of snow free conditions. One measurement in the OTC's and four outside the control plots were carried out. The probing of the controls took place approximately 30 cm from the corner stakes at different places for every measurement. This probing intensity was followed by probing of all plots on a weekly basis for the rest of the season. Totally, the plots at the Ridge and the Meadow site were probed 21 and 22 times, respectively.

On August 20 probing in the Meadow site took place at the four corners closest to the stake by the OTC's in addition to the usual procedure.

6. Phenological recording

6.1. The Ridge site

The recording started on June 15, nine days earlier than in 1994, as the re-establishment of the site was made easier because of last year's bench markers. The beach Ridge near the NOAA laboratory was snow free on June 10 (D. Endres, pers. comm.). Mostly on a daily basis phenological recordings of the two key species *Cassiope tetragona* and *Salix rotundifolia*, in addition to all other vascular plant species occurring in the plots, were made on a daily basis using last year's methods (Bay 1995). All data are presented in Appendix 6, 7, 8, and 9. The recording ended August 25 giving observations over a period of 73 days.

As the non-ITEX species were not tagged the different phenological stages of each species may refer to different individuals. However, mostly it was the same individual recorded with the first flower buds that was the first plant to flower and shed petals.

In addition to the phenological monitoring of the key species *Cassiope tetragona* and *Salix rotundifolia* all other vascular plant species emerging in the plots were monitored according to phenological parameters most relevant for each species. A total of 25 vascular species have been monitored phenologically and quantitatively. Phenological data from the most abundant species, i.e. species occurring in more than half of the plots of the non-ITEX species, have been processed (Table 1). The phenological parameters used for each of these species are given in Table 2.

Table 1. The non-ITEX species monitored at the Ridge site in 1995. The number of occurrences in experimental and control plots are given.

	Experimental plots	Control plots
Alopecurus alpinus	5	1
Arctagrostis latifolia	12	15
Carex stans	3	2
Draba lactea	6	3
Draba micropetala	11	8
Festuca brachyphylla	1	1
Juncus biglumis	3	8
Luzula arctica	18	17
Luzula confusa	22	24
Oxyria digyna	1	-
Papaver Hulténii	10	11
Papaver lapponicum	2	-
Pedicularis kanei	6	5
Poa arctica	23	22
Potentilla hyparctica	23	24
Ranunculus nivalis	-	2
Saxifraga caespitosa	-	1
Saxifraga cernua	8	4
Saxifraga flagellaris	1	-
Saxifraga foliolosa	6	7
Saxifraga nivalis	3	5
Saxifraga punctata	19	23
Senecio atropurpureus	10	14
Stellaria laeta	24	22
Vaccinium vitis-idaea	-	2

Table 2. Phenological and quantitative measurements recorded of the non-ITEX species occurring in the plots at the Ridge.

	P 1	P 2	P 3	P4	P 5	P 6	P 7	P 8	P 9	P 10	Q 1
Alopecurus alpinus	+										
Arctagrostis latifolia	+	+								+	
Carex stans	+	+			+			+			
Draba lactea	+		+	+					+		
Draba micropetala	+		+	+					+		
Festuca brachyphylla	+	+									
Juncus biglumis	+		+	+					+		
Luzula arctica	+	+			+			+			
Luzula confusa	+	+			+			+			+
Oxyria digyna	+										
Papaver Hulténii	+		+	+			+				
Papaver lapponicum	+		+	+			+				
Pedicularis kanei	+	+	+	+			+				
Poa arctica	+	+					+			+	
Potentilla hyparctica	+		+	+	+	+					+
Ranunculus nivalis	+										
Saxifraga caespitosa		+	+	+			+				
Saxifraga cernua	+										
Saxifraga flagellaris	+										
Saxifraga foliolosa	+	+	+	+			+				
Saxifraga nivalis											
Saxifraga punctata	+		+	+	+		+				+
Senecio atropurpureus	+										
Stellaria laeta	+		+	+			+				

Phenological measurements:

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: First flower bud visible
P 4: First flower emerging
P 5: First stigma visible
P 6: Elongation of pedicel
P 7: First flower withering
P 8: Stigma withering
P 9: In fruit
P 10: Inflorescence expanding

Quantitative measurement:

Q 1: Length of pedicels

6.2. The Meadow site

Because of the different physiognomic structure of the Meadow compared to the vegetation of the Ridge the sampling method had to be modified. The monitoring unit of *Carex aquatilis* ssp. *stans* was delimited by a square of steel wire covering an area of 10 x 10 cm.

Three individuals or shoots of each of the other species in the plots were marked by placing a numbered metal nail with a species code close by the plants. The recording started June 26, and continued on a daily basis throughout the season for 62 days. The phenological parameters for each species are given in Appendix 10.

7. Experiment to document the vertical and horizontal distribution of the air temperature in OTC's

7.1. Experiment with the vertical distribution of the air temperature in OTC's

Three OTC's were set up in homogeneous vegetation on the beach Ridge, just within the ARCSS grid (Fig. 6), on June 20 and 21.

At an interval of 5 cm, thermistors for vertical temperature recording were set up on a wooden stake, and placed in the centre of one OTC. A similar arrangement of data loggers on a stake was placed outside the OTC as control. The thermistors were shielded

Fig. 5. The set-up of the vertical air temperature experiment. Further explanation is given in the text.

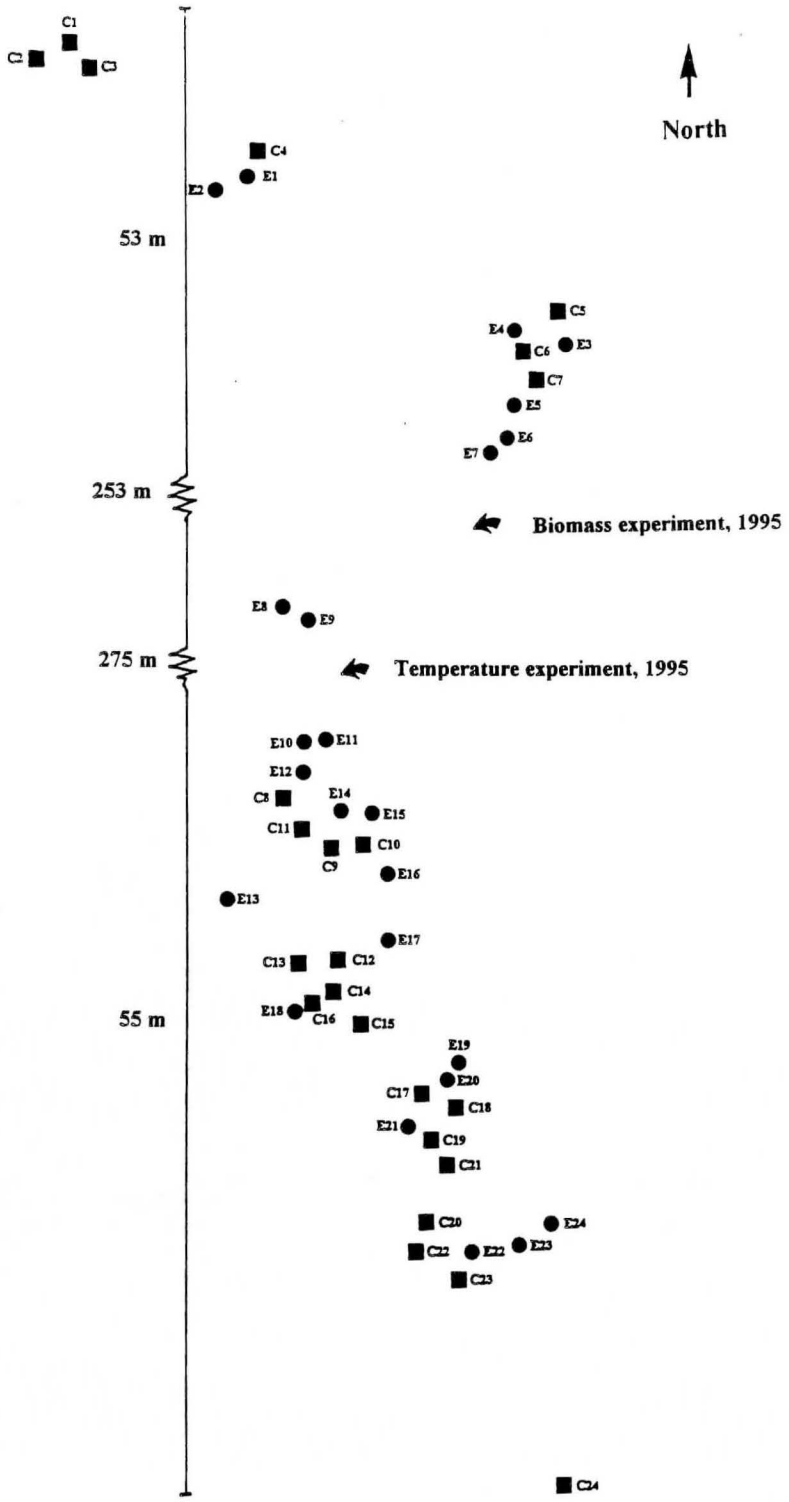


Fig. 6. The location of experimental (E) and control (C) plots in the ITEX site at the beach Ridge with indications of the location of the other experimental sites.

by white Styrofoam cups at the following levels above the ground: 1, 6, 11, 16, 21, 26, 31, and 36 cm (Fig. 5). The Hobo data loggers recorded every 9 minutes for 8 days. The temperature data are presented in Table 1.

7.2. Experiment with the horizontal distribution of the air temperature in OTC's

In three OTC's thermistors were fixed to a horizontal aluminium rod oriented in a north-south direction through the centre of the OTC. The rod was three cm above the vegetation and the thermistors were shielded from direct radiation by white Styrofoam cups. The distance from the edges of the OTC to the first thermistors was 15 cm. One thermistor was placed in the centre and another two were placed between these as shown on Fig. 7. The temperature recording took place over a period of 12 days with interval of 2 minutes for the StowAways, and over 8 days with intervals of 6.4 minutes for the Hobo loggers (Table 3).

Three shielded thermistors were placed as controls outside the OTC's (Table 19).

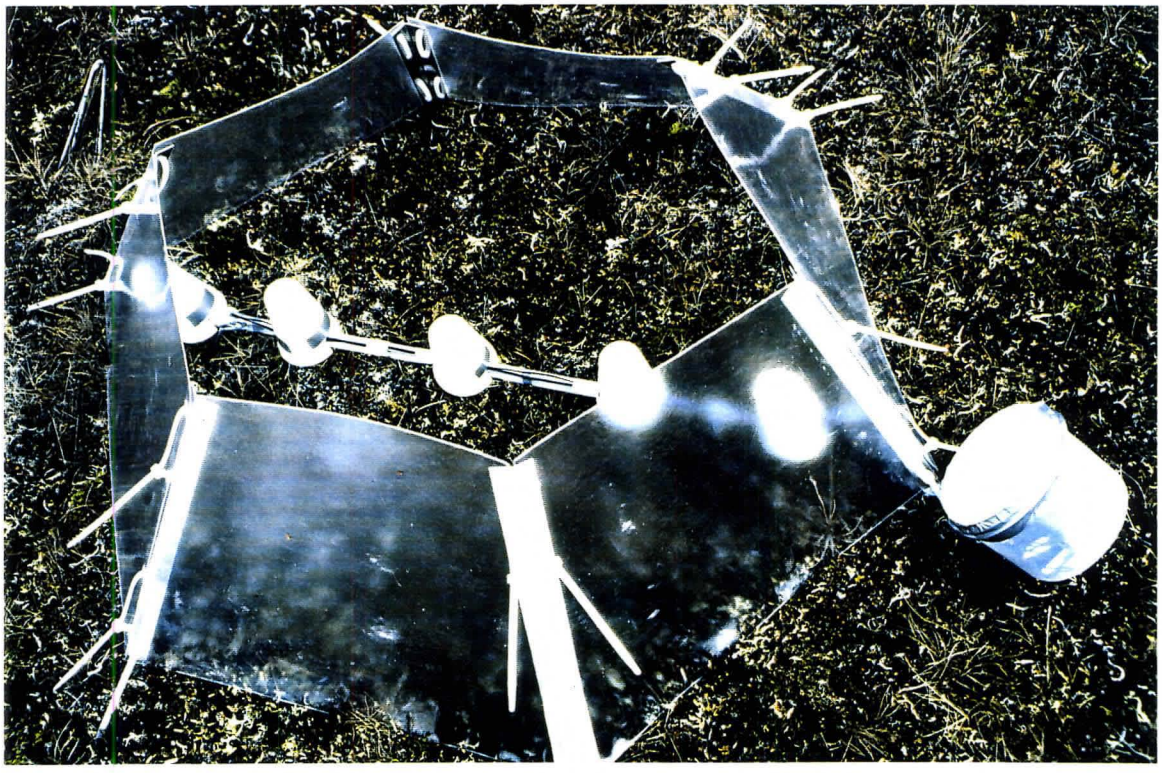


Fig. 7. Set-up of the horizontal air temperature experiment. Further explanation is given in the text.

8. Biomass study

In a homogeneous vegetation just south of the first group of plots on the beach Ridge (Fig. 5), dominated by the two ITEX species *Salix rotundifolia* and *Carex aquatilis* ssp. *stans*, three OTC's (BE 1-3) and six controls (BC 1-6) were set up randomly on June 24.

Table 3. Vertical variation of mean, minimum, and maximum air temperature in experimental (OTC) and control plots.

OTC					Control				
Distance from ground (cm)	Hobo #	Air temperature (° C) Date and time of min. and max. temp.			Distance from ground (cm)	Hobo #	Air temperature (° C) Date and time of min. and max. temp.		
		Mean ± SD	Minimum	Maximum			Mean ± SD	Minimum	Maximum
1	8	5.7 ± 4.8	-1.9 June 27; 2:38	22.0 June 29 16:04	1	0	4.0 ± 3.4	-2.8 June 27; 2:24	16.7 June 29 13:12
6	9	5.9 ± 5.2	-2.8 June 27; 2:38	26.6 June 29 16:04	6	16	3.8 ± 3.4	-3.2 June 27; 2:24	17.4 June 29 13:12
11	10	6.2 ± 5.3	-3.2 June 27; 2:38	27.3 June 29 16:04	11	17	3.9 ± 3.7	-3.2 June 27; 2:24	16.1 June 29 13:12
16	11	6.6 ± 5.5	-3.2 June 27; 2:38	27.0 June 29 12.00	16	18	3.5 ± 3.2	-3.2 June 27; 2:24	15.7 June 29 14:24
21	12	6.1 ± 5.0	-3.6 June 27; 2:44	22.7 June 29 6:10	21	19	3.2 ± 3.0	-3.2 June 27; 2:36	16.7 June 29 13:29
26	13	6.0 ± 4.8	-3.6 June 27; 2:35	23.8 June 29 16.01	26	20	3.3 ± 3.1	-3.2 June 27; 2:36	16.4 June 29 13:20
31	14	5.5 ± 4.6	-3.2 June 27; 2:36	24.1 June 29 16:02	31	21	3.4 ± 3.2	-3.2 June 27; 2:37	15.4 June 29 13:20
36	15	4.4 ± 3.8	-3.6 June 27; 2:36	19.9 June 29 16:03	36	22	3.2 ± 2.9	-2.8 June 27; 2:38	15.0 June 29 13:11

Another three OTC's were set up on July 2 (BE 4-6).

On August 12 and 13 the vegetation of the 12 plots were analyses according to Walker (1995) using the point-quadrate method (Mueller-Dombois and Ellenberg 1974) (Appendix 11). The plots (70 x 70 cm) were divided into 4 equal units and permanently stringed, making it possible to harvest the biomass from four equal units for four subsequent growing seasons. On August 15 and 16 harvesting took place in the north-western sections of the plots. Harvesting of the above ground biomass of all alive vascular plants as well as cryptograms was carried out in 35 x 35 cm areas (Fig. 8). The material was frozen for later analysis.

Fig. 8. Plot after harvesting of the above ground biomass in mid-August.

9. The effects of OTC's on soil conditions

Hydra soil moisture probes for measuring soil moisture volume (%), salinity, conductivity (Real E, Imag E), and soil temperature (°C) were installed in one of the OTC's used for the biomass investigation and two were placed just outside at a depth of app. 5-7 cm on June 30. Three times a week the probes were read.

10. Vegetation analyses

The analyses of the 48 plots at the Ridge site were made according to the instructions in the addition to the ITEX manual (Walker 1995) using a slightly modified point-quadrate method (Mueller-Dombois and Ellenberg 1974. The height from the vegetation analysis frame to the plants was measured from the top of the frame, and not from the underside of the frame. The height from the corner tags to the frame was measured to the underside of the device on the frame where the legs are attached. The analysing started when the vegetation peaks in mid-July, and the plots of the uppermost part of the Ridge were analysed first, as they were most developed. Within the following weeks the plots in the site were analysed, ending on August 14 in the low-lying, late snow-free areas. All vegetation analyses are presented in Appendix 12.

The identification of the mosses was carried out by Barbara Murray, University of Alaska Museum, Fairbanks, during a 2 ½ days stay in mid-August. Her expertise on the lichens, too, made us realise that our identifications of the species named *Peltigera* on the vegetation analyse sheets are not fully reliable.

11. Documentation

Voucher specimens of the ITEX species have been collected as recommended in the additions to the ITEX manual (Murray 1995) and delivered to David Murray, University of Alaska Museum, Fairbanks.

12. Results and discussion

12.1. Results of the temperature recording

12.1.1. The Ridge site

Data from the StowAway data loggers have been downloaded and all functioned satisfactorily. The mean, maximum, and minimum temperatures for each chamber and control have been calculated (Table 5). During the analyses of the vegetation in the experimental plots the OTC's were removed, consequently the temperature recordings during these periods have been subtracted before calculating the mean values.

Comparing the mean air temperature data in the two types of plots from the entire summer shows that the temperature difference between OTC's and the controls is on an average 1.71° C (4.89° C in OTC's vs. 3.18° C in controls). This results is very similar to the recording after the temperature manipulation last year (1.75° C). The mean temperature in the controls is 0.9° C above the temperature recorded at a height of 2 meters at the nearby NOAA laboratory.

The difference in mean air temperature between the two years of 1.6° C measured at the NOAA laboratory (3.9° C vs. 2.3° C) shows that the temperature in 1994 was substantially higher than in 1995. The mean air temperature in the controls during the two summers showed a 2.76° C higher summer temperature in 1994 (5.94° C vs. 3.18° C) resulting in a temperature above zero 87% higher in 1994.

The maximum temperature for the summer recorded by NOAA was 17.2° C on August 9, whereas the maximum was 20.1° C in some of the control plots. The mean maximum temperature in experimental plots was 5.2° C above the maximum in controls.

The minimum temperature for the summer in controls and by NOAA was 4.9° C and 2.5° C, respectively. There was no difference in minimum temperature between experimental and control plots.

The comparison of the two types of shields used in 1994 (Styrofoam cups) and in 1995 (Gill six-plate radiation shields) showed that the mean temperature is 18% higher in the Styrofoam cups (2.95 vs. 2.49° C) whereas the difference in mean maximum and mean minimum temperature is only 6% and 2%, respectively. If it is a general trend that the difference in mean summer temperature comparing 1994 and 1995 is 18% higher because of another type of shields, the difference in summer temperature between the years is 2.21° C and not 2.76° C as stated above.

12.2. Results of the relative humidity recording

The results from the recording by the humidity data loggers are given in table 4. The mean humidity is c. 10% lower in the open-top chambers (80% vs. c. 91%), which is an effect of the air temperature enhancement. The minimum humidity is also lower (51% vs. 34%), whereas there is no difference in the mean maximum humidity. The relative humidity inside the OTC's showed distinct diurnal patterns (Fig. 9) which consistently paralleled each small variation of the controls suggesting that there is good ventilation within the OTC's.

Table 4. Relative humidity data from the two types of plots. Two of the data loggers did not work properly.

Number of data logger	Plot type (E/C) and number	Mean relative humidity (%)	Minimum relative humidity (%)	Maximum relative humidity (%)
1	E 15	78.8	36.0	100
3	E 14	82.0	29.4	100
5	E 17	-	-	-
7	E 21	78.9	34.7	100
9	E 18	80.3	36.7	100
Mean		80.0	34.3	100
2	C 10	91.5	52.5	100
4	C 8	90.1	47.9	100
6	C 12	91.4	54.4	100
8	C 16	90.0	50.3	100
10	C 21	-	-	-
Mean		90.7	51.3	100

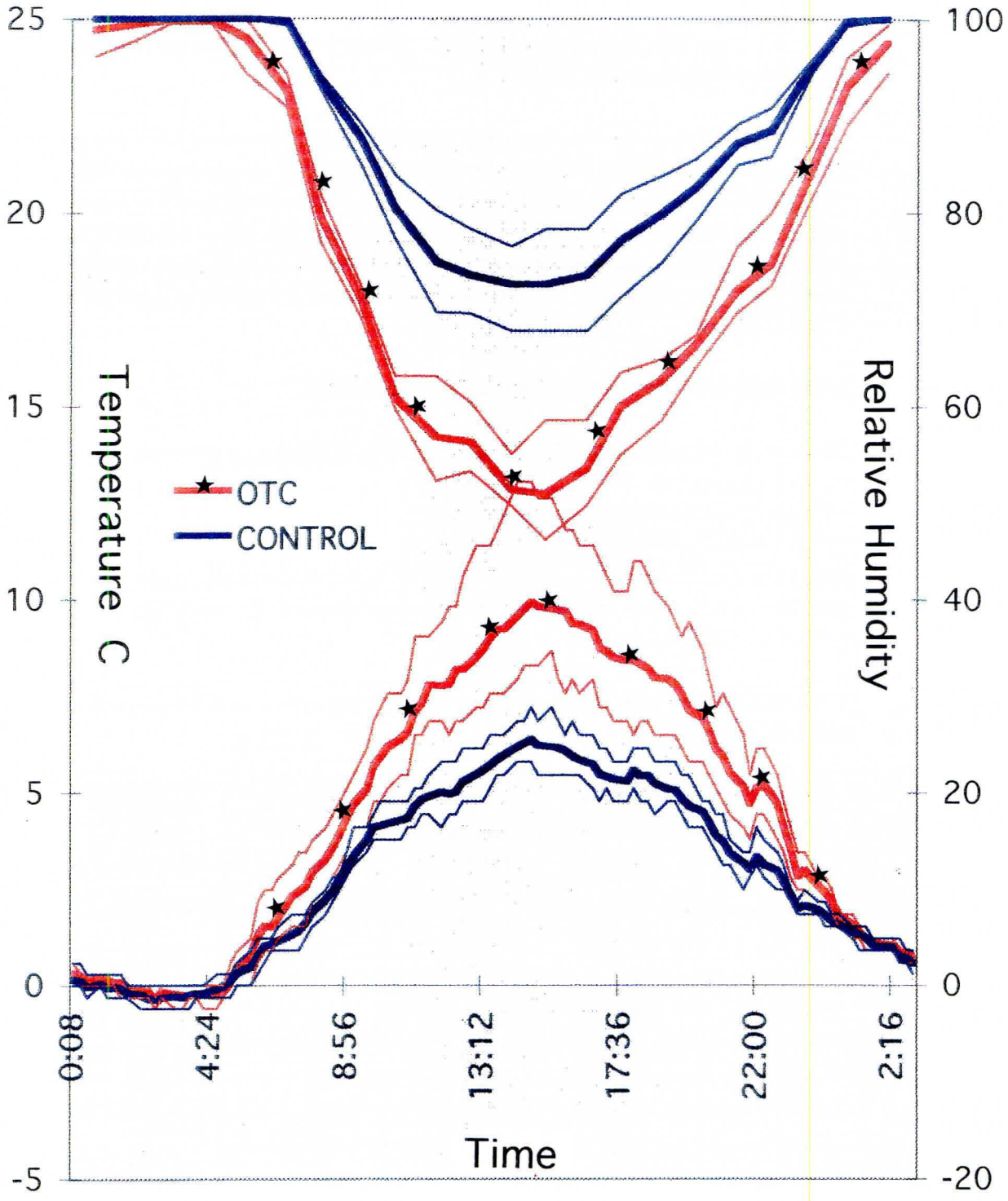


Fig. 9. The diurnal patterns of relative humidity (above graphs) and temperature (below graphs) in an OTC and a control plot on a sunny day. Thick graphs are mean values, thin graphs are maximum and minimum values.

12.3. Results of probing

12.3.1. The Ridge site

The maximum depth of thaw in OTC's and controls at the Ridge was 72 cm and 74 cm, respectively. There was a difference in depth of thaw from the first day between OTC's and controls but this is not likely to be a result of the warming effect of the OTC's last summer but rather a result of the natural variation. The actual depth of thaw in the period when the experiment was running showed a depth of 64 cm and 62 cm in OTC's and controls, respectively. As the difference is only significant in shorter period during the summer, the OTC's seam to have no warming effect on the thaw of the active layer throughout the season. The hysteresis of the large permafrost mass surrounding the OTC's dampens the progression of warming into deeper regions of the active layer. Fig. 10 illustrates the development of mean depth of the active layer at the Ridge site and at the Meadow site. An expected effect of the OTC's in the beginning of the summer was not seen.

12.3.2. The Meadow site

In the Meadow site the values of maximum depth of thaw is 37 cm and 38 cm for OTC's and controls, respectively, and the depth of thaw after the site was established is 34 cm and 36 cm; the controls having the largest depth. The difference in depth of thaw between experimental and control plots was significant in shorter periods, but there is no clear pattern (Fig. 10).

Table 5. Mean, maximum, and minimum air temperature for the control plots (C) and the open-top chambers (E).

Plot number	Data logger # (StowAway)	Mean air temperature (° C)	Maximum air temperature (° C)	Minimum air temperature (° C)
C 1	13	3.1	19.6	-4.6
C 2	14	3.4	19.1	-4.6
C 4	15	3.2	19.6	-4.6
C 5	16	3.0	19.6	-4.6
C 7	17	3.0	19.6	-4.6
C 8	18	3.1	19.1	-4.6
C 10	19	3.4	19.1	-4.6
C 11	20	3.1	19.6	-4.6
C 12	21	3.3	20.1	-4.6
C 13	22	3.1	19.6	-4.9
C 15	23	3.0	19.1	-4.6
C 16	24	3.3	19.1	-4.4
C 17	25	3.2	19.1	-4.6
C 18	26	3.3	20.1	-4.6
C 21	27	3.1	19.1	-4.6
C 22	28	3.2	19.6	-4.6
C 23	29	3.4	20.1	-4.6
C 24	30	3.0	18.6	-4.6
Mean		3.2	19.3	-4.5
E 1	32	5.2	25.3	-4.9
E 2	31	4.9	26.6	-4.4
E 3	33	4.9	25.9	-4.6
E 5	34	4.7	24.1	-4.6
E 6	35	5.1	24.7	-4.6
E 9	36	4.9	24.1	-5.2
E 10	37	5.2	24.7	-4.6
E 13	39	4.7	22.9	-4.6
E 14	40	5.1	25.3	-4.4
E 15	41	5.0	25.3	-4.6
E 16	42	5.3	24.1	-4.4
E 17	43	4.6	22.9	-4.6
E 18	44	5.0	24.7	-4.9
E 20	45	4.9	25.3	-4.6
E 21	46	4.7	23.5	-4.6
E 23	47	4.7	24.1	-4.4
E 24	48	4.3	22.9	-4.4
Mean		4.9	24.5	-4.5

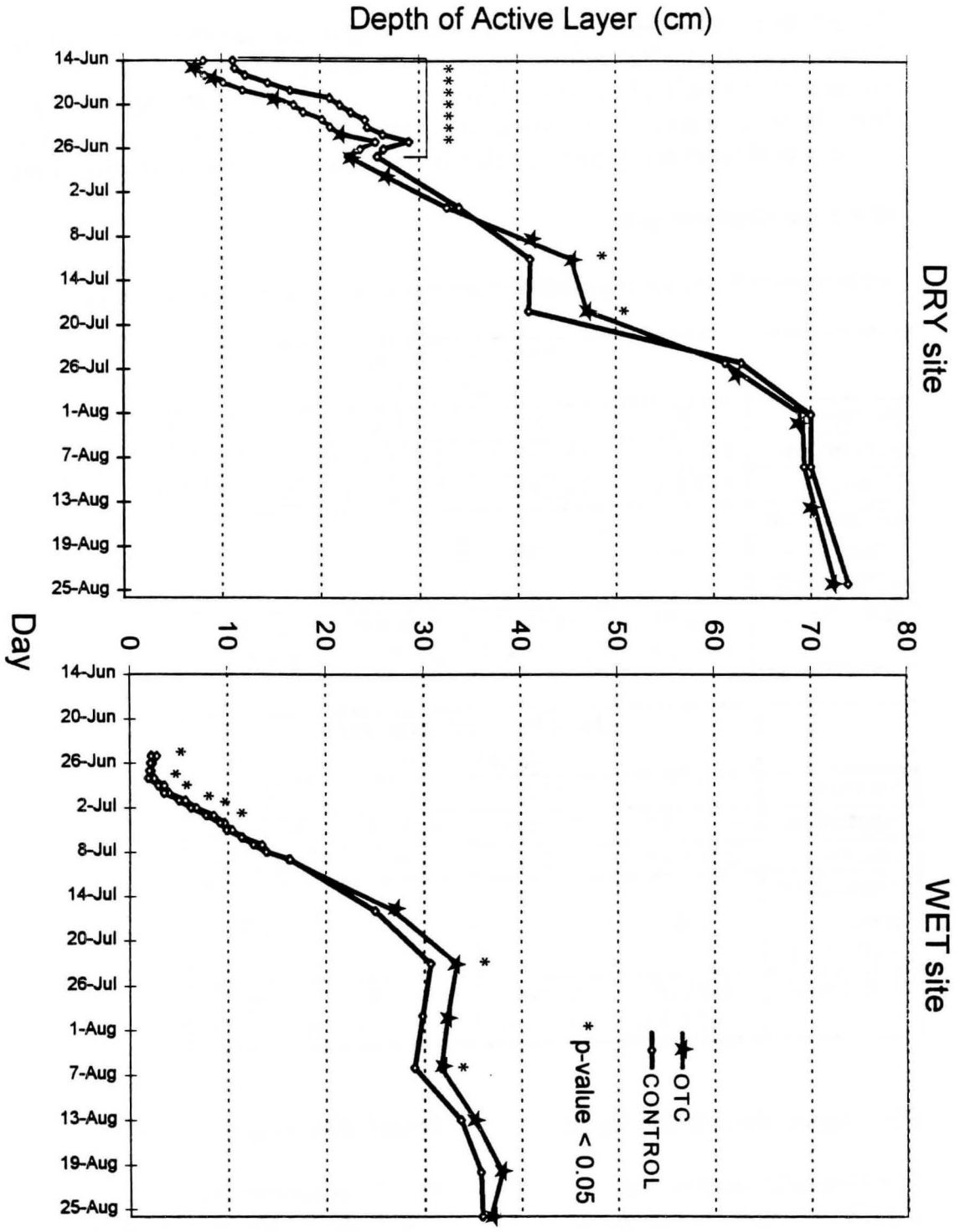


Fig. 10. Mean depth of the active layer in OTCs and controls at the Ridge site (DRY site) and the Meadow site (WET site) during the growth season.

12.4. Results of the phenological and quantitative recordings of the ITEX species

The results from the phenological and quantitative measurements are given in Appendix 6 and 7, and summarised below comparing the results from the experimental plots and the controls for each of the two ITEX-species and the seven other species. The results from the *Salix rotundifolia* recordings are divided according to sex. The Mann-Whitney U-test is used when determining the significance of the experimental manipulations.

12.4.1. *Cassiope tetragona*

Table 6. Phenological and quantitative measurements of *Cassiope tetragona*.

	Phenological dates (mean ± SD)			
Parameter	P 2	P 3	P 4	P 5
Experiment	176.8 ± 5.5	181.9 ± 4.1	193.4 ± 4.6	204.7 ± 7.1
Control	187.4 ± 5.3	192.4 ± 9.7	206.2 ± 9.7	218.3 ± 9.1
Difference in means (CTL - EXP)	10.6	10.5	12.8	13.6
M-W U-test	see text n = 22 + 5	see text n = 22 + 5	see text n = 22 + 5	see text n = 22 + 3

	Quantitative measurements (mean ± SD)			
Parameter	Q 1	Q 2	Q 3	Q 4
Experiment	4.0 ± 1.9	1.0 ± 0	0.5 ± 0	5.3 ± 0.8
Control	2.6 ± 1.6	0	0	4.8 ± 0.8
Difference in means (EXP - CTL)	1.4	-	-	0.5
M-W U-test	see text n = 24 + 5	see text n = 1 + 0	see text n = 1 + 0	$p < 0.05$ n = 24 + 24

Phenological dates (Julian days):

P 2: First coloured flower buds
P 3: First elongation of pedicels
P 4: First open flower
P 5: First corolla drop

Quantitative measurements:

Q 1: Total number of flowers
Q 2: Total number of developing fruits
Q 3: Fruit/Flower ratio (Q 2/Q 1)
Q 4: Annual growth increment (cm)

As only very few of the tagged plants in the controls flowered this year, the number of observations in the two types of plots was too uneven for making a comparison.

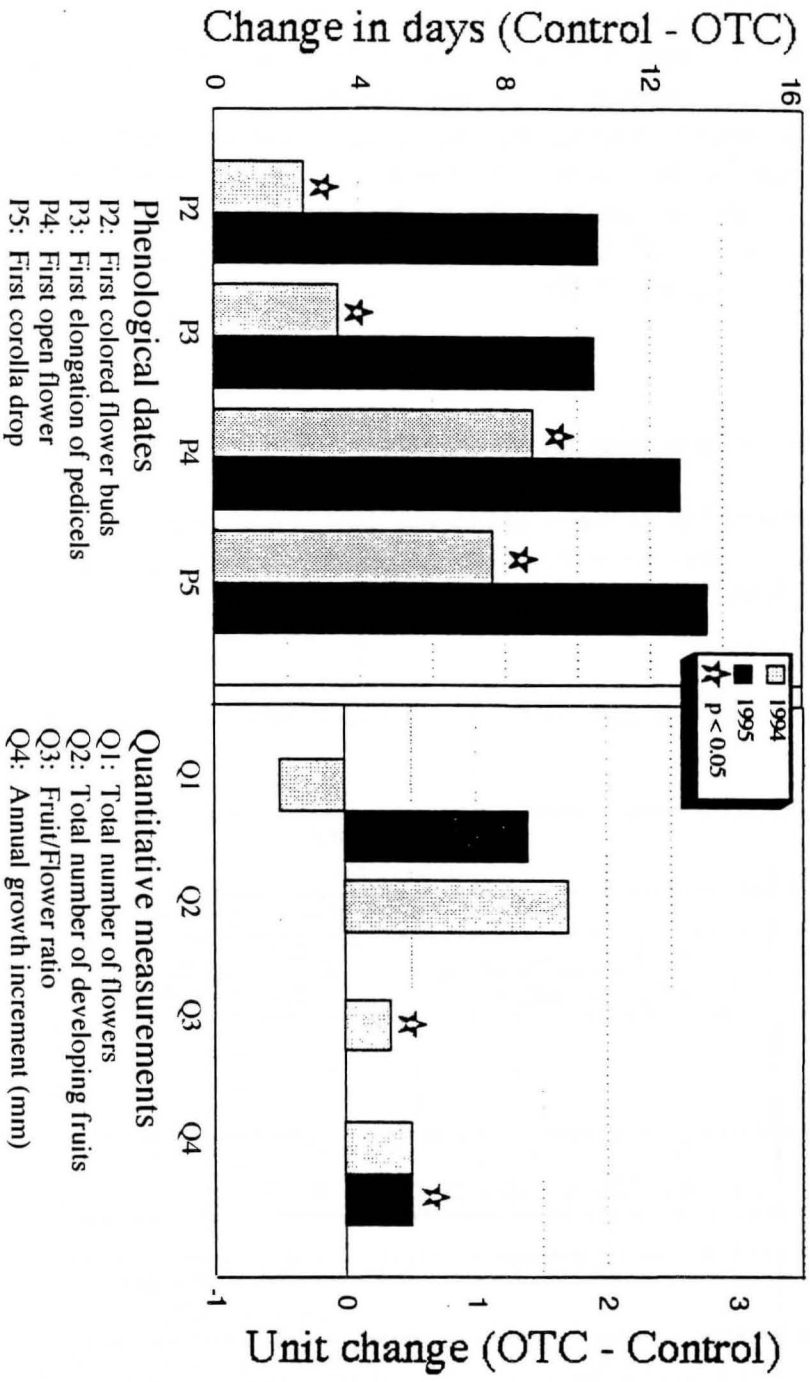


Fig. 11. Differences between phenological phases and quantitative measurements of *Cassiope tetragona* plants. In 1994 all phenophases were significantly earlier in the OTCs, while in 1995 there was not a significant difference between the OTC and the control plants ($p<0.05$). This difference may be attributed to the cold summer of 1995. The Fruit/Flower ratio was significantly larger in the OTCs than in the control plots in 1994, while in 1995 the annual growth in increment was significantly larger in the OTCs than in the controls.

The difference in annual growth increment of 0.5 cm between experimental and control plots was just barely significant. Although this difference is the same as last summer the growth was much smaller in 1995 (5.3 vs. 13.5 cm in OTC's and 4.8 vs. 13.0 cm in controls) probably a response to the cold summer.

The cold summer disturbed the monitoring of *Cassiope tetragona* as only very few flowers emerged in the control plots. The number of flowers in the OTC's was not larger compared to last year, hence we did not find the effect recorded in high arctic Canada where the number of flowers increased significantly after the first summer of manipulations (Johnston 1995).

12.4.2.1. *Salix rotundifolia*, female plants

Ten of the tagged female plants and eleven male plants flowering in 1994 did not flower this summer. A monitoring unit for male plants is established in E 24, where no male plants were flowering last year.

Table 7. Phenological and quantitative measurements of *Salix rotundifolia*, female plants.

	Phenological dates (mean ± SD)			
Parameter	P 2	P 3	P 4	P 5
Experiment	170 ± 3	177 ± 4	227 ± 8.4	224 ± 2.5
Control	171 ± 3.9	180 ± 4.6	227 ± 8.1	224 ± 1.3
Difference in means (CTL - EXP)	1.0	3.0	0	0
M-W U-test	NS n = 24 + 24	$p < 0.05$ n = 18 + 19	NS n = 14 + 7	NS n = 14 +14

	Quantitative measurements (mean ± SD)							
Parameter	Q 1	Q 2*	Q 3	Q 4*	Q 5	Q 6	Q 7	Q 8
Experiment	3.9 ± 3.1	5.2 ± 0.7	3 ± 2	1.9 ± 0.9	0.37	10.4 ± 3.2	3.2 ± 2.3	0.77
Control	4.7 ± 5.0	4.0 ± 1.3	2.7 ± 2.4	2.2 ± 0.6	0.55	8.6 ± 1.4	1.4 ± 1.3	0.57
Difference in means (EXP - CTL)	- 0.8	1.2	0.3	- 0.3	- 0.18	1.8	1.6	0.20
M-W U-test	NS n = 18 + 19	NS n = 18 + 19	NS n = 14 + 15	NS n = 18 + 19	NS n = 18 + 19	$p < 0.05$ n = 14 + 16	$p < 0.005$ n = 13 + 16	NS n = 14 + 15

Phenological dates (Julian days):

P 2: First leaf bud burst
P 3: First stigma visible
P 4: Onset of seed dispersal
P 5: First yellowing of leaves

Quantitative measurements:

Q 1: Total number of flowering catkins
Q 2*: Number of flowers in each catkin
Q 3: Total number of mature catkins
Q 4*: Number of capsules in each catkin
Q 5: Fruit/Flower ratio (Q 4/Q 2)
Q 6: Length of longest leaf (including petiole) (mm)
Q 7: Weight of largest leaf (including petiole) (mg)
Q 8: Mature catkin/Flowering catkin ratio (Q 3/Q 1)

* The actual number of flowers (Q 2) and capsules (Q 4) are given in Appendix 7.

As the identification of the sexes of *Salix* is impossible on vegetative plants when the leaves are emerging in the beginning of spring, the phenological parameter "first leaf bud burst" (P 2) is recorded for the species without distinguishing between female and male plants. The data is recorded on the female data sheet only.

Some of the tagged plants - 6 in OTC's and 5 in CTL's - did not flower this year, giving a smaller number of recordings in P 3, P 4, and P 5. Whereas the onset of dispersal of seeds in the OTC's started in 14 of the plots, only plants in 7 control plots had started the dispersal of seeds by the end of the recording period. Only about half of the plants in the experimental plots (n = 14) and control plots (n = 14) had started to change the colour of the leaves from green to yellow by the end of the recording period.

Except for the stage "first stigma visible" (P 3) there is no significant differences in the onset of the phenological stages this year comparing experimental and control plots. The first stigma emerged on an average three days earlier in the OTC's.

Compared to last year the early stages started 5-9 days earlier this year in both types of plots, whereas the onset of seed dispersal is 8 days later in OTC's and 2 days in controls this year. There is no difference in the length of the growing season between OTC's and controls this year, but compared to 1994 there is an increase because of an earlier start of 5 days in OTC's and 9 days in controls.

Differences in length and weight of the leaves are the only quantitative recordings that show significant differences between plants in experimental and control plots. However, the difference in length of the longest leaf (1.8 mm) is significantly bigger in the experimental plots, the difference in weight (1.6 mg) is highly significant.

Compared to last year the length is slightly smaller this year, whereas the weight is slightly higher. Contrary to last year there is a difference (1.2) in the number of flowers

in the catkins (Q 2), but it is not significant, and the expectation of an increase in number of flowers caused by the warming last summer, that could have influenced the production of this years flowers, is not recorded for female plants. Actually, the mean number of flowers in each catkin decreased from 6.3 and 6.4 in OTC and controls, respectively, in 1994 to 5.2 and 4.0 in 1995.

As there was no significant difference in 1994 between the number of flowering catkins in the experimental plots and the controls although the monitoring units were non-randomly selected, the number of flowering catkins (Q 1) in 1995, and the number of mature catkins (Q 3) after two summers of treatment are comparable. The differences are not significant, indicating that the survival of catkins is not influenced by the temperature enhancement or by other effects that the OTC's might have.

As there is no significant difference in the number of flowers (Q 2) and capsules (Q 4) in each catkin in the two types of plots, the fruit/flower ratio (Q 5) is unaffected by the experimental manipulation. The same goes for the ratio between mature catkin and flowering catkin (Q 8).

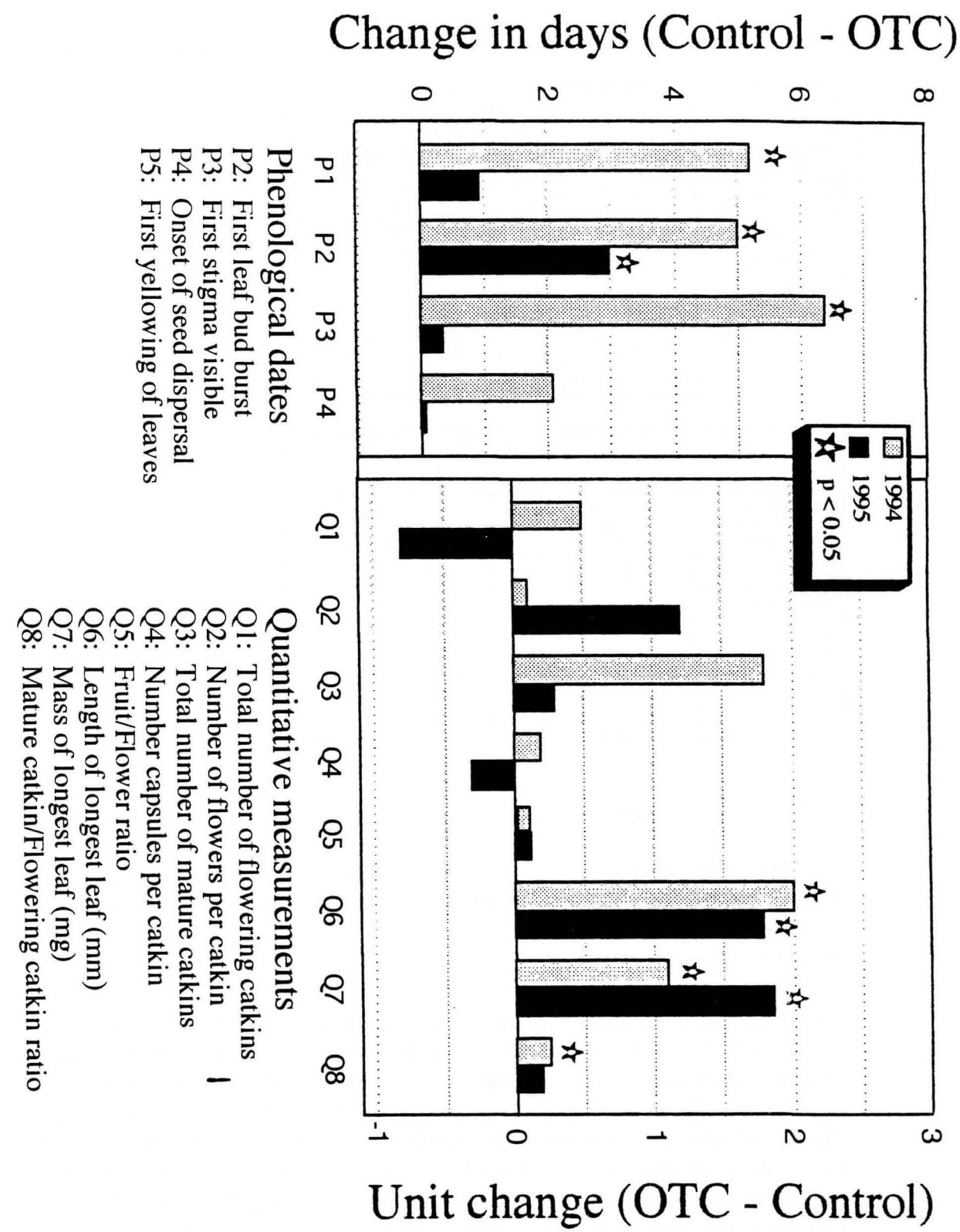


Figure 12. Differences between phenological phases and quantitative measurements of *Salix rotundifolia*, female plants.

12.4.2.2. *Salix rotundifolia*, male plants

Table 8. Phenological and quantitative measurements of *Salix rotundifolia*, male plants.

	Phenological dates (mean ± SD)		
Parameter	P 3	P 4	P 5
Experiment	180.3 ± 4.1	183.2 ± 4.8	225.1 ± 2.8
Control	185.5 ± 4.3	188.1 ± 4.8	223.5 ± 1.8
Difference in means (CTL - EXP)	5.2	4.9	- 1.6
M-W U-test	$p < 0.005$ n = 17 + 20	$p < 0.005$ n = 17 + 20	NS n = 13 + 20

	Quantitative measurements (mean ± SD)	
Parameter	Q 1	Q 2
Experiment	8.7 ± 2.3	2.0 ±1.4
Control	8.3 ± 1.7	1.3 ± 0.9
Difference in means (EXP - CTL)	0.4	0.7
M-W U-test	NS n = 14 +19	$p < 0.05$ n = 13 + 19

Phenological dates (Julian days):

P 3: First pollen shed
P 4: All pollen shed of the first flowering catkin
P 5: First yellowing of leaves

Quantitative measurements:

Q 1: Length of longest leaf (mm)
Q 2: Weight of largest leaf (mg)

The male plants started flowering 3-5 days after the females (OTC: 180.3 vs. 177.0; control: 185.5 vs. 180.0). Like the females the flowering started earlier this summer. The onset of dispersal of pollen (P 3) and the time of all pollen released (P 4) were highly significant earlier in the OTC's; on an average 5.2 days and 4.9 days earlier, respectively. The period of pollen release is only slightly longer in the experimental plots - 2.9 days vs. 2.6 days - an increase of c. 10%, which contrasts a 34% longer period in 1994.

There is a non-significant difference of 1.6 days comparing the dates of the first yellowing of the leaves in the two types of plots. This year nearly 70% of the plants had started yellowing by the end of the recording period; last year only few had begun to senesce. The recording stopped 4 days earlier in 1994. Contrary to last year the yellowing

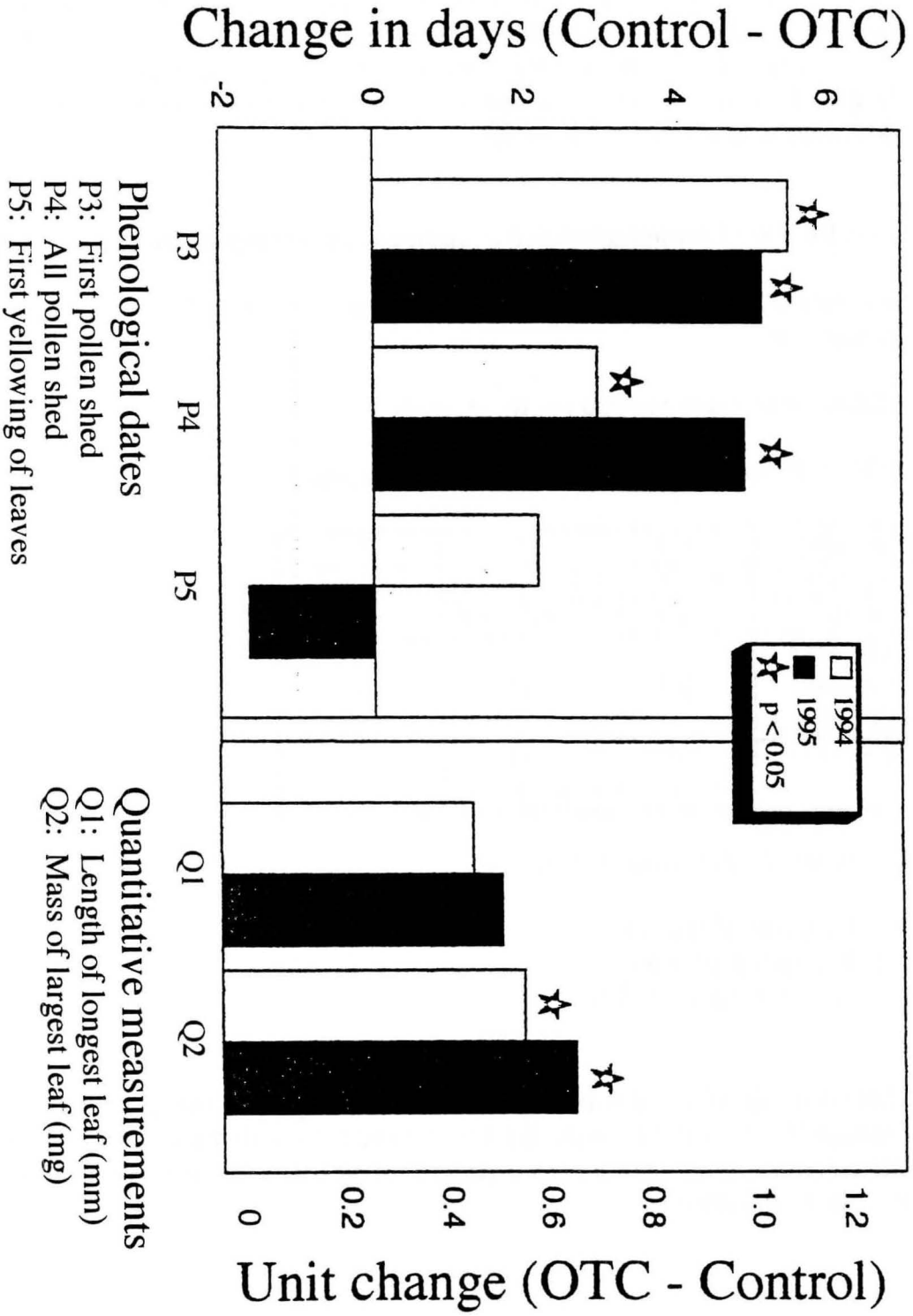


Figure 13. Differences between phenological phases and quantitative measurements of *Salix rotundifolia* male plants. The growth stages of first pollen shed, and all pollen shed occur significantly earlier in the OTCs than in the controls for both years ($p<0.05$). The mass of the largest leaf of a reproductive male was significantly heavier in the OTCs than in the controls for both years ($p<0.05$).

of the leaves started in the controls. There is a significant difference in the weight of the largest leaf (Q 2) of plants in the OTC's, having on an average 35% heavier leaves. On the other hand there is no difference between the two types of plots, when comparing the length of the longest leaf. The opposite situation was recorded in 1994: a significant difference in length but not in weight.

12.5. Results of phenological and quantitative recordings of the non-ITEX species

Among the 25 non-ITEX species occurring in the plots data the most frequent ones are presented below.

12.5.1. *Arctagrostis latifolia* (R. Br.) Griseb.

Table 9. Phenological measurements of *Arctagrostis latifolia.*

Parameter	P 1	P 2	P 3
Experiment	167.8 ± 2.1	197.4 ± 7.7	227.7 ± 3.7
Control	168.1 ± 2.6	206.0 ± 6.8	-
Difference in means (CTL-EXP)	0.3	8.6	-
M-W U-test	NS n = 11 + 15	NS n = 6 + 4	-

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: Inflorescence expanding

There is no significant difference in the time of emerging of the first leaf (P 1) or inflorescence (P 2) when comparing the manipulated plots with the controls. As none of the inflorescences in the control plots expanded in the end of the season it was not possible to make a comparison.

12.5.2. *Luzula arctica* Blytt.

Table 10. Phenological measurements of *Luzula arctica.*

	Phenological dates (mean ± SD)				Quantitative measurements
Parameter	P 1	P 2	P 3	P 4	Q 1
Experiment	167.0 ± 1.5	174.8 ± 2.1	182.3 ± 4.7	191.5 ± 2.2	9.7 ± 2.8
Control	166.9 ± 1.2	177.0 ± 3.1	183.7 ± 3.9	192.7 ± 3.1	7.0 ± 2.6
Difference in means (CTL-EXP)	- 0.1	2.2	1.4	1.2	-2.7
M-W U-test	NS n = 17 + 16	NS n = 12 + 11	NS n = 14 + 13	NS n = 14 + 13	$p < 0.05$ n = 14 + 10

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: First stigma visible
P 4: Stigma withering

Quantitative measurement:

Q 1: Length of pedicel (cm)

There are no differences in any of the phenological parameters. A significant difference in the length of the pedicels is recorded; being on an average 2.7 mm longer in the experimental plots.

12.5.3. *Luzula confusa* Lindeb.

Table 11. Phenological and quantitative measurements of *Luzula confusa.*

	Phenological dates (mean ± SD)				Quantitative measurements
Parameter	P 1	P 2	P 3	P 4	Q 1
Experiment	168.6 ± 2.0	182.1 ± 4.2	186.9 ± 5.5	198.9 ± 6.7	11.9 ± 2.6
Control	169.0 ± 2.2	182.4 ± 4.9	192.2 ± 6.0	192.2 ± 6.0	8.1 ± 2.3
Difference in means (CTL-EXP)	0.4	0.3	5.3	- 6.7	- 3.8
M-W U-test	NS n = 20 + 24	NS n = 19 + 19	$p < 0.005$ n = 21 + 24	$p < 0.05$ n = 21 + 20	$p < 0.005$ n = 18 + 20

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: First stigma visible
P 4: Stigma withering

Quantitative measurement:

Q 1: Length of pedicel (cm)

There is no significant difference between plants in the control and experimental plots comparing the early phenological stages. On the other hand there are differences in the time of onset of flowering (P 3) and withering of flowers (P 4). The difference in "first stigma visible" is highly significant ($p < 0.005$), whereas the time of withering of the stigmas is significant ($p < 0.05$). The average difference of 3.8 mm is a highly significant difference of the length of the pedicels.

Contrary to last year, where the two first phenological parameters had significant differences when comparing experimental and control plots, it was only the last two parameters that showed significant differences this year.

12.5.4. *Poa arctica* R. Br.

Table 12. Phenological measurements of *Poa arctica.*

	Phenological dates (mean ± SD)		
Parameter	P 1	P 2	P 3
Experiment	168.2 ± 1.1	201.8 ± 9.1	223.6 ± 3.1
Control	167.6 ± 1.2	204.8 ± 3.2	218.5 ± 4.5
Difference in means (CTL-EXP)	- 0.6	3.0	- 5.1
M-W U-test	NS n = 23 + 22	NS n = 12 + 5	Too few data n = 10 + 2

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: Inflorescence expanding

It has only been possibly to compare two of the phenological parameters as the number of data of the last phenological stage was to small. There is no significant difference in the time of emerging of the first leaf (P 1) and flowering (P 2) when comparing plants from the two types of plots.

12.5.5. *Potentilla hyparctica* Malte

Table 13. Phenological and quantitative measurements of *Potentilla hyparctica.*

	Phenological dates (mean ± SD)				Quantitative measurements
Parameter	P 1	P 2	P 3	P 4	Q 1
Experiment	167.0 ± 2.5	175.6 ± 4.0	185.4 ± 4.9	188.1 ± 4.4	10.1 ± 2.8
Control	166.6 ± 1.4	177.7 ± 5.3	191.6 ± 4.3	193.8 ± 3.7	5.9 ± 1.7
Difference in means (CTL-EXP)	- 0.4	2.1	6.2	5.7	- 4.2
M-W U-test	NS n = 23 + 24	NS n = 20 + 23	$p < 0.005$ n = 22 + 24	$p < 0.005$ n = 22 + 24	$p < 0.005$ n = 22 + 23

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: First flower bud visible
P 3: Flowering
P 4: Elongation of pedicel

Quantitative measurement:

Q 1: Length of pedicel (cm)

There is no significant difference between the two types of plots comparing the early phenological stages (P 1, P 2), whereas there is a highly significant difference ($p < 0.005$) of 5-6 days in the later stages (P 3, P 4). The length of the pedicels is on an average 4.2 mm longer in the experimental plots; a highly significant difference.

This year *Potentilla hyparctica* responded in exactly the same way as after the first summer of experimental manipulations.

12.5.6. *Saxifraga punctata* L. ssp. *nelsoniana* (D.Don.) Hult.

Table 14. Phenological and quantitative measurements of *Saxifraga punctata* ssp. *nelsoniana*.

	Phenological dates (mean ± SD)				
Parameter	P 1	P 2	P 3	P 4	P 5
Experiment	173.3 ± 5.7	178.5 ± 5.5	183.8 ± 4.5	193.4 ± 4.7	204.9 ± 6.9
Control	172.9 ± 5.3	174.9 ± 5.1	185.1 ± 4.3	194.9 ± 3.9	206.9 ± 6.2
Difference in means (CTL-EXP)	- 0.4	- 3.6	1.3	1.5	2.0
M-W U-test	NS n = 14 + 20	NS n = 16 + 15	NS n = 17 + 18	NS n = 18 + 16	NS n = 19 + 15

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: First flower bud visible
P 3: Elongation of pedicel
P 4: Flowering
P 5: First flower withering

	Quantitative measurements (mean ± SD)
Parameter	Q 1
Experiment	12.2 ± 2.8
Control	8.3 ± 2.0
Difference in means (CTL-EXP)	- 3.9
M-W U-test	$p < 0.005$ n = 17 + 17

Quantitative measurement:

Q 1: Length of pedicel

This species does not at all respond phenologically to the temperature manipulations. On the other hand the pedicels are significantly longer in the OTC's - the difference is on an average 3.9 cm. Last year it responded significantly in three of four phenological stages and had a strong growth response as well.

12.5.7. *Stellaria laeta* Richards.

Table 15. Phenological measurements of *Stellaria laeta.*

	Phenological dates (mean ± SD)			
Parameter	P 1	P 2	P 3	P 4
Experiment	166.8 ± 0.9	194.6 ± 13.8	216.3 ± 16.9	219.0 ± 13.1
Control	166.5 ± 1.3	194.3 ± 11.8	224.1 ± 8.1	231.3 ± 4.9
Difference in means (CTL-EXP)	- 0.3	- 0.3	7.8	12.3
M-W U-test	NS n = 24 + 22	NS n = 18 + 21	NS n = 10 + 8	NS n = 6 + 4

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: First flower bud visible
P 3: Flowering
P 4: First flower withering

In 1995 *Stellaria laeta* did not respond to the warming in any of the phenological stages. Last year there were significant differences both in first flower bud visible and flowering.

Table 16. Comparison of the responses of the non-ITEX species between the two years of experimental warming in 1994 (italic) and 1995 (bold). Four levels of significance are given. NS: non-significant, and three levels of significance: $p < 0.05$, < 0.01, and < 0.005.

	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	Q 1
Arctagrostis latifolia	*NS;* **NS**	**NS**							
Luzula arctica	*p < 0.05;* **NS**	*NS;* **NS**	*NS;* **NS**	*NS;* **NS**					**p < 0.05**
Luzula confusa	*p < 0.005;* **NS**	*p < 0.01;* **NS**	*NS;* **p < 0.005**	*NS;* **p < 0.05**					*p < 0.005;* **p < 0.005**
Poa arctica	*NS;* **NS**	**NS**							
Potentilla hyparctica	*NS;* **NS**				*NS;* **NS**	*p < 0.005;* **p < 0.005**	*p < 0.005;* **p < 0.005**		*p < 0.005;* **p < 0.005**
Saxifraga punctata	*p < 0.05;* **NS**				*NS;* **NS**	*p < 0.05;* **NS**	**NS**	*p < 0.05;* **NS**	*p < 0.005;* **p < 0.005**
Stellaria laeta	*NS;* **NS**				*p < 0.005;* **NS**	*p < 0.05;* **NS**		*NS*	

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: First stigma visible
P 4: Stigma withering
P 5: First flower bud visible
P 6: Flowering
P 7: Elongation of pedicel
P 8: First flower withering

Quantitative measurement:

Q 1: Length of pedicel

The level of significance of response of all the species is summarised in Table 16 and compared to the results from 1994.

Generally, there is a difference in how the non-ITEX species are responding to the experimental manipulations. None of the species are responding to the manipulation with earlier phenology. There is a significant response of the length of the pedicel in all four species considered.

Of the 25 pairs of recordings from the two years 14 responded in the same way in both years (Table 16). The quantitative measurement "length of the pedicels" showed the most consistent response to the experimental warming.

12.6. Experiment with the vertical distribution of the air temperature in OTC's

The difference in mean temperatures between OTC's and controls at the same level above the ground is between 1.2 and 3.1° C (Table 17, Fig. 13). The largest difference is recorded at 16 cm above the ground, exactly in the middle of the OTC. The temperature declines from here approaching both the ground and the top of the OTC. The temperature difference is 45% and 61% bigger in the middle than at the ground and the top of the chamber, respectively.

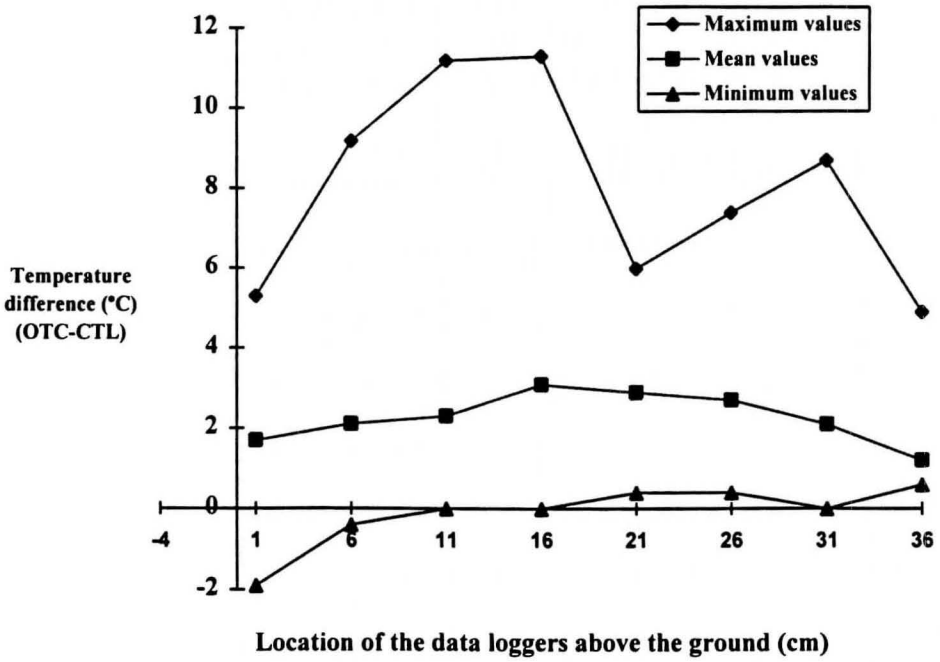
The difference in minimum air temperature shows that the minimum temperature in the OTC is 1.9° C below the ambient temperature at the ground level (Table 17). There is no or only minor differences (0-0.6° C) in minimum temperature at the 6-36 cm levels of the OTC.

The mean maximum values show the largest temperature difference (11.3° C) between the OTC and the control in the centre (16 cm above the ground) of the OTC. From here the difference declines to the ground and the top level.

Table 17. Vertical variation in differences in mean, minimum, and maximum temperatures in the open-top chambers.

Distance from ground (cm)	Difference in mean temperatures (° C) (OTC - CTL)	Difference in minimum temperature (° C) (OTC - CTL)	Difference in maximum temperature (° C) (OTC - CTL)
1	1.7	-1.9	5.3
6	2.1	-0.4	9.2
11	2.3	0	11.2
16	3.1	0	11.3
21	2.9	0.4	6.0
26	2.7	0.4	7.4
31	2.1	0	8.7
36	1.2	0.6	4.9

Fig. 14. Vertical variation in difference in maximum, mean, and minimum temperatures (OTC - CTL) in open-top chambers.



12.7. Experiment with the horizontal distribution of the air temperature in an OTC

Only in one of the experimental plots all the Hobo data loggers have been recording properly (Table 18).

The variation in the mean temperature ranges from 4.1° C at the edge in the southern part of the OTC to 5.9° C in the northern part (Fig. 14). The minimum temperatures across the OTC are rather even, whereas the variation of the maximum temperatures of two neighbouring data loggers is 7.4° C (26.2-18.8° C); an increase within 15 cm of 40%. This seems to indicate that one logger was not operating properly as all the other loggers recorded nearly the same maximum value (18.5 - 19.2° C). If this data logger is not considered the variation across the OTC is only c. 1 °C (5.2 - 4.1° C).

The variation of the horizontal mean temperatures is slightly smaller than the variation in the vertical temperatures (4.4 - 6.6).

Table 18. Horizontal variation in air temperature in an open-top chamber.

Location	Hobo #	Air temperature (°C)		
		Mean ± SD	Minimum	Maximum
Edge, north	26	5.2 ± 4.1	-2.8	18.8
Mid, north	27*	5.9 ± 5.1	-3.2	26.2
Centre	28	5.1 ± 4.2	-3.2	19.2
Mid, south	29	4.5 ± 3.7	-2.8	18.5
Edge, south	30	4.1 ± 3.8	-3.2	18.5

* See text.

Fig. 15. Variation in maximum, mean, and minimum temperatures in the horizontal temperature experiment in an open-top chamber.

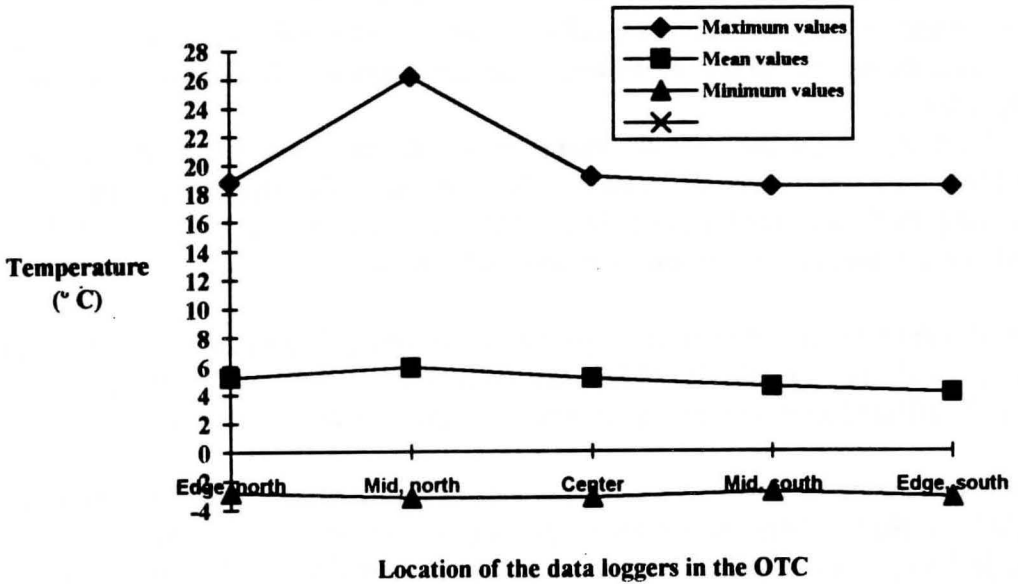


Table 19. Air temperature in controls to the horizontal temperature experiment.

Hobo #	Air temperature (° C)		
	Mean ± SD	Minimum	Maximum
23	3.5 ±	-2.8	16.4
24	4.0 ±	-3.8	16.6
25	3.7 ±	-2.3	17.1

13. Conclusions

The manipulation of the air temperature by using open-top chambers showed, exactly like last year, an increase of 1.7° C during the growing season, although the mean air temperature was 70% lower (1.6° C).

The plants started growing earlier this year although the date of meltoff is nearly the same: June 10 in 1995 vs. June 12 in 1994. Comparing the temperature in the beginning of the growing season recorded by NOAA shows that the temperature was substantial higher in the first week after the establishment of the site started in mid June: 2.5° C in 1995 vs. -0.7° C in 1994. The days just before that, the difference was 2.1° C warmer in 1995. The difference declines to 0.2° C in the next two weeks following the week with the maximum difference.

The final depth of thaw during the summer in both sites was not affected by the experimental warming.

The cold summer of 1995 made monitoring of *Cassiope tetragona* difficult as only very few flowers emerged in the control plots. The number of flowers in the OTC's was not larger compared to last year, hence we did not record the effect that has been seen in high arctic Canada where the number of flowers increased significantly after the first summer of manipulations.

The difference in annual growth increment of 0.5 cm between experimental and control plots was just barely significant. Although this difference is the same as last summer the growth was much smaller in 1995 (5.3 vs. 13.5 in OTC's and 4.8 vs. 13.0 in controls) and is undoubtedly a response to the cold summer.

Contrary to the result of last year the experimental warming had nearly no effects on the phenology of *Salix rotundifolia*. Like last year the growth of female plants was significantly affected as shown by an increase in length and weight of leaves.

There is a difference in how the non-ITEX species are responding to the experimental manipulations. None of the species are responding to the manipulation by on setting all phenological stages significantly earlier in the experimental plots. The only significant response was the length of the pedicel in all four species considered. Of the 25 pairs of recordings from the two years 14 responded in the same way in both years.

13.1. Changes in the species composition in the plots

One of the expected responses of a change in an ecosystem caused by a temperature enhancement is, that species can immigrate to suitable habitats further to the north. Over time recording of species new to the general study area is likely to be a result of immigration from southern localities. Occurrences of species common in the surroundings of the site, but new to the plots has either taken place by means of local dispersal of diaspores or by germination from the seed bank in the plots. An increase in soil temperature is expected to increase the germination rate of seeds.

The 16 species new to the plots were evenly distributed with 33 recordings in experimental and 32 recordings in control plots. The species and their occurrences are given in Table 19. Of a total of 16 recordings of 10 plant species that disappeared from the plots since 1994, 11 had occurred in the experimental plots . The chambers do not seem to have an effect on the germinability from the seed bank after two summers with enhanced air temperatures.

Among the new occurrences *Saxifraga cernua* is the most frequent. Of the 12 occurrences 11 were new in 1995. *Saxifraga nivalis* and *Juncus biglumis* are also frequent new species with 6 and 5 new occurrences, respectively. *Draba lactea* is the only species with a marked decline in occurrence: in 7 of the 13 plots where it was recorded in 1994 it did not showed up the following year. The differences between the years do not seem to be a result of the warming, rather a natural change in the species composition of a natural vegetation.

14. Continuation of the project

The field work and reporting will be taken over by Lisa Walker and Bob Hollister, masters students of Michigan State University supervised by Professor Patrick Webber. The detailed vegetation analyses at the Meadow site are planned to take place during the summer 1996. The U.S. involvement in the ITEX project is planned to be expanded by another side at Atquasuk. This locality was one of the major study sites during the RATE (Research on Arctic Tundra Environment) project in the 1970's and valuable information on the environment is available. Atquasuk is located c. 100 km south of Barrow and this distance from the coast makes the climate and vegetation as well as other biological and physical conditions very different from the Barrow site, which is strongly influenced by the coastal conditions. In mid-August two sites were established by setting up stakes by the plants to be monitored and preliminary species lists were made. Both sites are within the ARCSS grid south-east of the village. One site is at an old beach Ridge on sandy soil with *Cassiope tetragona* and the other site is in a nearby marsh dominated by *Carex aquatilis* ssp. *stans* and *Salix pulchra*.

Table 20. Occurrence of the species in experimental and control plots in 1994 (1) and 1995 (2). Species which had disappeared the second year is indicated by a bold **1** and species new to the plots in 1995 by a bold **2**. Abbreviations of species names are given in the species list (Appendix 2).

Experimental plots

Exp. plot	Alo. alp.	Arc. lat.	Car. sta.	Dra. lac.	Dra. mic.	Fes. bra.	Jun. big.	Luz. arc.	Luz. con.	Oxy dig.	Pap. hul.	Pap. lap.	Ped. kan.	Poa. arc.	Pot. hyp.	Ran niv.	Sax. cae.	Sax. cer.	Sax. fla.	Sax. fol.	Sax. niv.	Sax. pun.	Sen. atr.	Ste. lae.	Vac vit.
E 1		1/2						1/2	1/2					1/2	1/2					1/2		1/2	1/2	1/2	
E 2		1/2		1/2	1/2			1/2	1/2					**2**	1/2					1/2		1/2	1/2	1/2	
E 3	1/2	1/2						1/2	1/2		1/2			**2**	1/2					**2**	**2**	1/2	1/2	1/2	
E 4			1/2		1/2		1/2	1/2	1/2			1/2		1/2	1/2					1/2		1/2	**1**	1/2	
E 5	1/2	1/2	1/2	**1**	**2**			1/2	1/2					1/2	**2**							1/2	1/2	1/2	
E 6	1/2	1/2	**1**	1/2	**2**			1/2						1/2	1/2			**2**				1/2	1/2	1/2	
E 7	1/2	**2**	1/2	1/2	**2**			1/2						1/2						1/2		1/2	**2**	1/2	
E 8				**1**				1/2	1/2		1/2			1/2	1/2									1/2	
E 9				**1**	1/2			1/2	1/2		1/2			1/2	1/2			**2**	1/2			1/2	1/2	1/2	
E 10				**2**	**2**			1/2	1/2	1/2	1/2			1/2	1/2							1/2		1/2	
E 11	1/2				**2**				1/2		1/2	1/2		**2**	1/2			**1**				1/2		1/2	
E 12		1/2		1/2	**2**			1/2	1/2		1/2		1/2	**2**	1/2			**2**				1/2		1/2	
E 13									1/2				1/2	1/2	1/2									1/2	
E 14					1/2			1/2	1/2				1/2	1/2	1/2									1/2	
E 15		1/2		**1**					1/2				1/2	2	1/2			**2**			1/2	1/2	1/2	1/2	
E 16		1/2		**2**				**2**	1/2				1/2	1/2	1/2			**2**				1/2		1/2	
E 17		1/2		**1**	1/2		**2**	1/2	1/2		1/2		**2**		1/2					**1**		1/2		1/2	
E 18		1/2						**1**	1/2					**2**	1/2							1/2	1/2	1/2	
E 19						**2**		1/2	1/2					1/2	1/2			**2**			1/2			1/2	
E 20							1/2		1/2					1/2	1/2			**2**		**2**		1/2		1/2	
E 21								**2**	1/2					1/2	1/2							1/2		1/2	
E 22									1/2		1/2			1/2	1/2							1/2		1/2	
E23								**2**	1/2		1/2			1/2	1/2							1/2	1/2	1/2	
E 24		1/2						1/2	1/2		1/2			1/2	1/2			**2**				**1**		1/2	

Table 20 continued.

Control plots

Ctl. plot	Alo. alp.	Arc. lat.	Car. sta.	Dra. lac.	Dra. mic.	Fes. bra.	Jun. big.	Luz. arc.	Luz. con.	Oxy dig.	Pap. hul.	Pap. lap.	Ped. kan.	Poa. arc.	Pot. hyp.	Ran niv.	Sax. cae.	Sax. cer.	Sax. fla.	Sax. fol.	Sax. niv.	Sax. pun.	Sen. atr.	Ste. lae.	Vac vit.
C 1		1/2			1/2		**2**	1/2	1/2					1/2	1/2	**2**		**2**		1/2		1/2	1/2	1/2	
C 2	1/2	1/2			1/2		**2**	1/2	1/2					1/2	1/2	1/2				1/2		1/2	1/2	**1**	
C 3		1/2						1/2	1/2					1/2	1/2			**2**		**2**		1/2	1/2	1/2	
C 4		1/2				1/2	1/2	1/2	1/2		1/2			**2**	1/2					1/2		**2**	1/2	1/2	
C 5		1/2		**2**				1/2	1/2		1/2			1/2	1/2						**2**	**2**	1/2	1/2	
C 6			1/2				1/2	1/2	1/2					1/2	1/2					**2**	**2**	1/2	1/2	1/2	
C 7		1/2						1/2	1/2					**2**	1/2							1/2	1/2	1/2	
C 8		1/2	1/2	1/2	1/2			1/2	1/2		1/2		1/2	**2**	1/2			**2**				1/2	1/2	1/2	
C 9		1/2			1/2		**2**	1/2	1/2		**2**		1/2	1/2	1/2					**2**		1/2		1/2	
C 10		1/2		1/2	1/2		1/2	1/2	1/2		1/2		1/2	1/2	1/2		1/2				**2**	1/2	1/2		
C 11		1/2		**1**	1/2			1/2	1/2				1/2	**2**	1/2					**2**		1/2	1/2	1/2	
C 12					1/2			1/2	1/2		1/2				1/2						**2**	1/2		1/2	
C 13		1/2						1/2	1/2		1/2		1/2	**1**	1/2							1/2	1/2	1/2	
C 14		1/2			**2**			**2**	1/2					1/2	1/2							1/2		1/2	
C 15		1/2					**2**	1/2	1/2		1/2			1/2	1/2						**2**	**2**	1/2	1/2	
C 16							**2**		1/2		1/2			1/2	1/2							1/2		1/2	
C 17				**1**				1/2	1/2					1/2	1/2							1/2		1/2	
C 18		1/2							1/2					1/2	1/2							1/2		1/2	
C 19	**1**								1/2					1/2	1/2							1/2		1/2	
C 20									1/2		1/2			1/2	1/2							1/2		1/2	1/2
C 21		1/2							1/2					1/2	1/2			**2**						1/2	
C 22									1/2					1/2	1/2							1/2	1/2	1/2	1/2
C 23								1/2	1/2					**2**	1/2							1/2	**2**	1/2	
C 24									1/2		1/2			1/2	1/2							1/2		1/2	

The *Cassiope* population at Barrow occurs in a narrow zone between areas on the upper part of the beach Ridge where the snow cover is only shallow during winter and areas on the lower part, where the late thawing snow bank reduces the length of the growing season. As the *Cassiope* population has such a limited distribution on the Ridge it is easy to study the spatial changes of the distribution of the population in the coming years. The population occurs where the ecological demands of the species is fulfilled i.e. where there is a constant snow cover during winter and where the snow melt is early leaving a growing season of about two months. It is recommended to mark all the individuals growing along the margin of the population and follow the changes in the distribution of these, as it is expected that an increase in precipitation caused by the global warming, will limit its distribution towards the Meadow as an increase in accumulation of snow will reduce the length of the growing season. On the other hand it will be possible for the population to expand eastwards on the Ridge if the snow cover will increase in the coming decades, as the areas today have a too thin and unstable snow cover to support *Cassiope tetragona.*

The pilot project studying the vertical and horizontal variation of the temperature in the OTC's could be extended by using more replicates and by having it run for a longer period. Also a more complete and deeper soil temperature record would be useful to compare against active layer depths.

15. Acknowledgements

I appreciate the assistance, data processing, and good company by Lisa Walker and Bob Hollister during the field work. Barbara Murray is thanked for the identifications of mosses and lichens, Ken Hinkel for placing snow maps at my disposal, and Fritz Nelson for taking care of all kind of logistical matters. Dan Endres and Malcolm Gaylord are thanked for placing NOAA temperature data at my disposal, practical help, and the excellent neighbourliness on the tundra.

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17. Appendices

Appendix 1. The order from north to south (left to right, top to bottom) of the experimental (E) and control (C) plots in the Meadow site and location of temperature data loggers (StowAway (ST), Hobo (HB) in the plots).

E1	C1	E2	E3	C2	E4	E5	C3	E6	C4	C5	E7
ST 1	ST 7	ST 2			ST 3		ST 8	ST 4	ST 9	ST10	ST 5

C6	E8	E9	C7	E10	E11	C8	E12	C9	E13	C10	E14
ST11	ST 6	HB0		HB7	HB8	ST12			HB9	HB18	HB10

E15	C11	C12	C13	E16	E17	E18	C14	C15	C16	C17	C18
	HB19	HB20		HB11	HB12		HB21	HB22	HB23	HB24	

C19	E19	C20	C21	E20	E21	E22	C22	E23	E24	C23	C24
HB25	HB13	HB26	HB27	HB14	HB15	HB16	HB28		HB17		HB29

Appendix 2. List of vascular plant species monitored phenologically on the Ridge site. Nomenclature and taxonomy according to Hultén 1968. The species codes (abbreviation) are given.

Alopecurus alpinus Sm. ssp. *alpinu*	Aloalp
Arctagrostis latifolia (R. Br.) Griseb. var. *Latifolia*	Arclat
Carex aquatilis Wahlenb. ssp. *stans* (Drej.) Hult.	Carsta
Cassiope tetragona (L.) D. Don	Castet
Draba lactea Adams	Dralac
Draba micropetala Hook.	Dramic
Festuca brachyphylla Schult. & Schult.	Fesbra
Juncus biglumis L.	Junbig
Luzula arctica Blytt	Luzarc
Luzula confusa Lindeb.	Luzcon
Oxyria digyna (L.) Hill	Oxydig
Papaver Hulténii Knaben	Paphul
Papaver lapponicum (Tolm.) Nordh. ssp. *occidentale* (Lundstr.) Knaben	Paplap
Pedicularis kanei Durand ssp. *kane*	Pedkan
Poa arctica R. Br.	Poaarc
Potentilla hyparctica Malte	Pothyp
Ranunculus nivalis L.	Ranniv
Salix rotundifolia Trautv.	Salrot
Saxifraga caespitosa L.	Saxcae
Saxifraga cernua L.	Saxcer
Saxifraga flagellaris Willd.	Saxfla
Saxifraga foliolosa R. Br.	Saxfol
Saxifraga nivalis L.	Saxniv
Saxifraga punctata L. ssp. *nelsoniana* (D. Don.) Hult.	Saxpun
Senecio atropurpureus (Ledeb.) Fedtsch. ssp. *frigidus* (Richards) Hult.	Senatr
Stellaria laeta Richards.	Stelae
Vaccinium vitis-idaea L. ssp. *minus* (Lodd.) Hult.	Vacvit

Appendix 3. List of cryptogams recorded in the plots at the beach Ridge site. Compiled by B. Murray, University of Alaska Museum, Fairbanks.

Lichens:
Alectoria nigricans (Ach.) Nyl.
Bryocaulon divergens (Ach.) Kärnefelt
Caloplaca sp.
Cetraria cuculata (Bellardi) Ach.
Cetraria delisei (Bory ex Schaer.) Nyl.
Cetraria islandica (L.) Ach.
Cetraria kamczatica Savicz.
Cetraria laevigata Rass.
Cetraria nivalis (L.) Ach.
Cetraria richardsonii Hook.
Cladonia spp.
Dactylina arctica (Richardson) Nyl.
Dactylina ramulosa (Hook.) Tuck
Hypogymnia subobscura (Vain.) Poelt
Lobaria linita (Ach.) Rabenh.
Nephroma expallidum (Nyl.) Nyl.
Ochrolechia frigida (Sw.) Lynge
Parmelia skultii Hale
Peltigera cf. *canina* or *membranacea*
Peltigera cf. *leucophlebia*
Peltigera malacea (Ach.) Funck
Psoroma hypnorum (Vahl) Gray
Ramalina almquistii Vain.
Rinodina sp.
Solorina crocea (L.) Ach.
Sphaerophorus globosus (Huds.) Vain.
Stereocaulon spp.
Sticta arctica Degel.
Thamnolia sp.

Liverworts:
Diplophyllum sp.
Gymnomitrion sp.
several other leaphy hepatics

Mosses:
Aulacomnium turgidum (Wahlenb.) Schwägr.
Bartramia ithyphylla Brid.
Bryoerythrophyllum recurvirostre (Hedw.) Chen.
Conostomum tetragonum (Hedw.) Lindb.
Dicranella sp.

Dicranum spp.
Distichium capillaceum (Hedw.) Bruck, Schimp. & W.Gümbel
Ditrichum flexicaule (Schwägr.) Hampe
Hylocomium splendens (Hedw.) Schimp. in Bruck, Schimp. & W.Gümbel
Hypnum sp.
Oncophorus wahlenbergii Brid.
Pogonatum dentatum (Brid.) Brid.
Pohlia cruda (Hedw.) Lindb.
Pohlia nutans (Hedw.) Lindb.
Polytrichastrum alpinum (Hedw.) G.L.Sm. var. alpinum
Polytrichum hyperboreum R. Br.
Polytrichum cf. *juniperinum* Hedw.
Polytrichum strictum Brid.
Racomitrium lanuginosum (Hedw.) Brid.
Rhytidium rugosum (Hedw.) Kindb.
Sanionia uncinata Hedw.
Timmia austriaca Hedw.
Tomenthypnum nitens (Hedw.) Loeske

Appendix 4. List of vascular plant species monitored phenologically at the Meadow site. Nomenclature and taxonomy are according to Hultén 1968.

Arctophila fulva (Trin.) Anderss.
Cardamine pratensis L.
Carex aquatilis Wahlenb. ssp. *stans* (Drej.) Hult.
Carex subspathacea Wormsk.
Cerastium beeringianum Cham. & Schlecht.
Cochlearia offinalis L. ssp. *arctica* (Schlecht.) Hult.
Draba lactea Adams
Draba micropetala Hook.
Dupontia fisheri R. Br. ssp. *fisheri*
Eriophorum russeolum Fr.
Eriophorum angustifolium Honck. ssp. *triste* (Th. Fr.) Hult.
Hierochloë pauciflora R. Br.
Juncus biglumis L.
Luzula arctica Blytt
Luzula confusa Lindeb.
Poa arctica R. Br.
Ranunculus nivalis L.
Ranunculus pygmaeus Wahlenb.
Salix pulchra Cham.
Salix rotundifolia Trautv.
Saxifraga caespitosa L.
Saxifraga cernua L.
Saxifraga foliolosa R. Br.
Saxifraga hieracifolia Waldst. & Kit.
Saxifraga hirculus L.
Saxifraga nivalis L.
Stellaria laeta Richards.

Appendix 5. Recording of temperature and relative humidity at the Ridge site. Date and time of onset and stop of temperature and humidity data loggers are given.

Experimental plots

Plot number	Number on StowAway (temperature) / Hobo (humidity) data loggers	Date and time of start of temperature recording	Date and time of start of relative humidity recording	Date and time of stop of recording during vegetation analyses	Date and time of stop of recording
E 1	32	June 16 18:00		August 14 8:50-9:25	August 22 10:00
E 2	31	June 16 18:00		August 14 9:30-10:00	August 22 10:00
E 3	33	June 16 18:00		August 11 4:15-5:15	August 22 10:00
E 4					
E 5	34	June 16 18:00		August 12 11:00-14:50	August 22 10:00
E 6	35	June 16 18:00		August 13 14:15-15:00	August 22 10:00
E 7					
E 8					
E 9	36	June 16 18:00		August 8 9:40-10:25	August 22 10:00
E 10	37	June 16 18:00		July 14 9:20-10:30	August 22 10:00
E 11	38	June 16 18:00		July 11 15:40-17:30	August 22 10:00
E 12					
E 13	39	June 16 18:00		July 21 10:50-15:40	August 22 10:00
E 14	40 / 3	June 16 18:00	June 22 12:00	July 14 14:10-15:15	August 22 10:00

Experimental plots (continued)

Plot number	Number on StowAway (temperature) / Hobo (humidity) data loggers	Date and time of start of temperature recording	Date and time of start of relative humidity recording	Date and time of stop of recording during vegetation analyses	Date and time of stop of recording
E 15	41 / 1	June 16 18:00	June 22 12:00	July 12 16:05-18:01	August 22 10:00
E 16	42	June 16 18:00		July 13 14:20-16:02	August 22 10:00
E 17	43 / 5	June 16 18:00	June 22 12:00	July 14 15:15-16:30	August 22 10:00
E 18	44 / 9	June 16 18:00	June 22 12:00	July 21 9:45-10:45	August 22 10:00
E 19					
E 20	45	June 16 18:00		July 20 15:45-16:30	August 22 10:00
E 21	46 / 7	June 16 18:00	June 22 12:00	July 21 16:25-17:05	August 22 10:00
E 22					
E 23	47	June 16 18:00		July 17 13:10-14:45	August 22 10:00
E 24	48	June 16 18:00		July 16 14:40-15:45	August 22 10:00

Control plots

Plot number	Number on StowAway (temperature) / Hobo (humidity) data loggers	Date and time of start of temperature recording	Date and time of start of relative humidity recording	Date and time of stop of recording
C 1	13	June 16 18:00		August 22 10:00
C 2	14	June 16 18:00		August 22 10:00
C 3				
C 4	15	June 16 18:00		August 22 10:00
C 5	16	June 16 18:00		August 22 10:00
C 6				
C 7	17	June 16 18:00		August 22 10:00
C 8	18 / 4	June 16 18:00	June 22 12:00	August 22 10:00
C 9				
C 10	19 / 2	June 16 18:00	June 22 12:00	August 22 10:00
C 11	20	June 16 18:00		August 22 10:00
C 12	21 / 6	June 16 18:00	June 22 12:00	August 22 10:00
C 13	22	June 16 18:00		August 22 10:00
C 14				

Control plots (continued)

Plot number	Number on StowAway (temperature) / Hobo (humidity) data loggers	Date and time of start of temperature recording	Date and time of start of relative humidity recording	Date and time of stop of recording
C 15	23	June 16 18:00		August 22 10:00
C 16	24 / 8	June 16 18:00	June 22 12:00	August 22 10:00
C 17	25	June 16 18:00		August 22 10:00
C 18	26	June 16 18:00		August 22 10:00
C 19				
C 20				
C 21	27 / 10	June 16 18:00	June 22 12:00	August 22 10:00
C 22	28	June 16 18:00		August 22 10:00
C 23	29	June 16 18:00		August 22 10:00
C 24	30	June 16 18:00		August 22 10:00

Appendix 6. Phenological and quantitative measurements of *Cassiope tetragona* and *Salix rotundifolia*.

***Cassiope tetragona* (L.) D. Don**
Experimental plots

No.	P1	P2	P3	P4	P5	Q1	Q2	Q3	Q4	Q5
E 1	164	171	180	190	199	8	0	0	5	-
E 2	164	181	183	193	198	4	0	0	5	-
E 3	164	-	-	-	-	0	0	0	6	-
E 4	169	181	187	198	212	3	0	0	5	-
E 5	167	181	187	198	209	3	0	0	5	-
E 6	167	184	187	198	207	4	0	0	4	-
E 7	168	181	188	201	223	8	0	0	4	-
E 8	164	180	180	194	203	3	0	0	7	-
E 9	164	188	185	199	218	2	0	0	5	-
E 10	164	170	176	187	199	3	0	0	7	-
E 11	164	170	176	185	196	1	0	0	4	-
E 12	164	173	180	192	203	8	0	0	6	-
E 13	164	180	184	194	206	4	0	0	6	-
E 14	164	-	-	-	-	0	0	0	5	-
E 15	164	169	173	184	196	2	1	0.5	6	-
E 16	164	172	178	189	199	3	0	0	6	-
E 17	164	173	181	196	216	6	0	0	5	-
E 18	164	173	180	189	203	4	0	0	5	-
E 19	164	171	180	189	198	3	0	0	6	-
E 20	164	173	180	196	204	5	0	0	5	-
E 21	164	185	187	197	205	4	0	0	6	-
E 22	164	180	185	196	204	3	0	0	5	-
E 23	164	174	180	193	198	4	0	0	5	-
E 24	164	180	185	196	208	2	0	0	5	-
Mean	164.6	176.8	181.9	193.4	204.7	4.0	1.0	0.5	5.3	-
SD	1.4	5.5	4.1	4.6	7.1	1.9	0	0	0.8	-

Phenological dates (Julian days):

P 1: Plots snow-free
P 2: First coloured flower buds
P 3: First elongation of pedicels
P 4: First open flower
P 5: First corolla drop

Quantitative measurements:

Q 1: Total number of flowers per ramet
Q 2: Total number of developing fruits per ramet
Q 3: Fruit/Flower ratio (Q 2/Q 1)
Q 4: Length of annual growth increment of main shoot (mm)
Q 5: Re-flowering: number of buds or flowers

Cassiope tetragona (L.) D. Don

Control plots

No.	P1	P2	P3	P4	P5	Comments	Q1	Q2	Q3	Q4	Q5
C 1	164	-	-	-	-		0	0	-	5	-
C 2	164	-	-	-	-		0	0	-	5	-
C 3	164	-	-	-	-		0	0	-	5	-
C 4	164	-	-	-	-		0	0	-	6	-
C 5	168	-	-	-	-		0	0	-	6	-
C 6	168	-	-	-	-		0	0	-	6	-
C 7	164	-	-	-	-		0	0	-	6	-
C 8	164	-	-	-	-		0	0	-	3	-
C 9	164	184	192	205	*	* withered	2	0	-	4	-
C 10	164	-	-	-	-		0	0	-	5	-
C 11	164	-	-	-	-		0	0	-	4	-
C 12	164	-	-	-	-		0	0	-	4	-
C 13	164	-	-	-	-		0	0	-	5	-
C 14	164	184	192	202	214		1	0	-	3	-
C 15	164	-	-	-	-		0	0	-	5	-
C 16	164	-	-	-	-		0	0	-	5	-
C 17	164	191	193	202	231		5	0	-	5	-
C 18	164	182	185	197	210		4	0	-	5	-
C 19	164	-	-	-	-		0	0	-	4	-
C 20	164	-	-	-	-		0	0	-	5	-
C 21	164	-	-	-	-		0	0	-	5	-
C 22	164	196	200	225	-		1	0	-	5	-
C 23	164	-	-	-	-		0	0	-	5	-
C 24	164	-	-	-	-		0	0	-	5	-
Mean	164.3	187.4	192.4	206.2	218.3		2.6	-	-	4.8	-
SD	1.1	5.3	9.7	9.7	9.1		1.6	-	-	0.8	-

Phenological dates (Julian days):

P 1: Plots snow-free
P 2: First coloured flower buds
P 3: First elongation of pedicels
P 4: First open flower
P 5: First corolla drop

Quantitative measurements:

Q 1: Total number of flowers per ramet
Q 2: Total number of developing fruits per ramet
Q 3: Fruit/Flower ratio (Q 2/Q1)
Q 4: Length of annual growth increment of the main shoot (mm)
Q 5: Re-flowering: number of buds or flowers

***Salix rotundifolia* Trautv., female plants**
Experimental plots

No.	P1	P2	P3	P4	P5	Q1	Q2	Q3	Q4	Q5	Q 6	Q 7	Q 8
E 1	164	171	181	215	221	3	6 ± 3.3	2	5.0 ± 3	0.83	12	3.0	0.67
E 2	164	172	177	236	223	7	5.6 ± 1	3	3.7 ± 1.7	0.66	9	1.5	0.43
E 3	164	172	-	-	-	0	-	0	-	-			-
E 4	169	176	183	236	228	2	7 ± 0	2	3 ± 2	0.43	9	2.1	1.00
E 5	167	174	181	236	225	1	4 ± 0	1	2 ± 0	0.50	6	0.8	1.00
E 6	167	176	185	-	-	1	5 ± 0	0	0	0			0
E 7	168	173	-	-	-	0	-	0	-	-			-
E 8	164	173	*	-	-	0	-	0	-	-			-
E 9	164	172	180	230	221	8	4.9 ± 1.8	7	2.4 ± 1.3	0.49	9		0.88
E 10	164	167	177	236	230	1	5 ± 0	1	4 ± 0	0.80	11	4.1	1.00
E 11	164	166	-	-	-	0	-	0	-	-			-
E 12	164	169	-	-	-	0	-	0	-	-			-
E 13	164	169	178	-	-	1	6 ± 0	0	0	0			0
E 14	164	167	176	229	223	5	4.4 ± 1.2	5	3.8 ±1	0.86	7	1.7	1.00
E 15	164	166	170	-	-	1	4 ± 0	0	0	0			0
E 16	164	166	170	215	223	2	5.5 ± 0.5	1	3 ± 0	0.55			0.50
E 17	164	169	173	217	221	3	4.3 ± 2.1	2	1.5 ± 0.5	0.35	10	2.2	0.67
E 18	164	167	173	219	223	7	5.6 ± 0.9	4	3.5 ± 0.9	0.63	9	3.7	0.57
E 19	164	170	178	236	223	2	6.5 ± 0.5	1	3 ± 0	0.46	9	2.5	0.50
E 20	164	173	-	-	-	0	-	0	-	-			-
E 21	164	171	178	231	223	4	4.5 ± 1.1	4	3.5 ± 2.1	0.78	11	3.3	1.00
E 22	164	169	174	219	225	11	5.8 ± 1.5	7	3.7 ±1	0.64	12	5.6	0.64
E 23	164	168	178	-	-	3	5.7 ± 0.9	0	0	0	11	1.7	0
E 24	164	169	174	220	223	9	4.1 ±1.4	2	4 ± 1	0.98	20	9.8	0.22
Mean	165	170	177	227	224	3.9	5.2	3	1.9	0.37	10.4	3.2	0.77
SD	1.4	3	4	8.4	2.5	3.1	0.7	2	0.9	0.18	3.2	2.3	0.25

* Plants grassed by lemming in monitoring unit

Phenological dates (Julian days):

P 1: Plots snow-free
P 2: First leaf bud burst
P 3: First stigma visible
P 4: Onset of seed dispersal
P 5: First yellowing of leaves

Quantitative measurements:

Q 1: Total number of flowering catkins per monitoring unit
Q 2: Number of flowers in each catkin (mean ± SD)
Q 3: Total number of mature catkins per monitoring unit
Q 4: Number of capsules in each catkin (mean ±SD)
Q 5: Fruit/Flower ratio (Q 4/Q 2) (mean ± SD)
Q 6: Length of longest leaf (including petiole) (mm)
Q 7: Weight of largest leaf (with petiole) (mg)
Q 8: Number of mature catkin/Number of young catkin (Q 3/Q 1).

***Salix rotundifolia* Trautv., female plants**

Control plots

No.	P1	P2	P3	P4	P5	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q 8
C 1	164	178	181	-	223	2	5.5 ± 2.5	2	4 ± 1	0.73	10	2.1	1.00
C 2	164	174	183	-	223	7	6.7 ± 2.1	3	4.7 ± 1.7	0.70	7	0.1	0.43
C 3	164	172	-	-	-	0	-	0	-	-			-
C 4	164	172	181	-	-	3	4.3 ± 0.5	0	0	0			0
C 5	168	180	188	-	228	4	3.3 ± 1.9	3	3 ± 1.6	0.91	8	0.7	0.75
C 6	168	180	183	236	223	3	3.3 ± 1.2	2	3.5* ± 1.5	1.06	7	0.9	0.67
C 7	164	174	187	-	223	2	3 ± 3	2	2.5 ± 0.5	0.83	7	0.9	1.00
C 8	164	169	181	220	223	3	6.3 ± 1.7	2	6 ± 1	0.95	9	2.1	0.67
C 9	164	169	180	-	-	3	7.7 ± 3.4	0	0	0			0
C 10	164	166	-	-	-	0	-	0	-	-			-
C 11	164	170	-	-	-	0	-	0	-	-	11	2.5	-
C 12	164	170	-	-	-	0	-	0	-	-	7	0.6	-
C 13	164	167	181	-	-	2	4 ± 1	1	2 ± 0	0.50	8	1.1	0.50
C 14	164	166	170	232	223	11	5.5 ± 1.2	9	4.3 ± 1.3	0.78	15	5.4	0.82
C 15	164	169	181	216	223	1	6 ± 0	1	3 ± 0	0.50	11	1.5	1.00
C 16	164	166	173	218	223	22	6 ± 2	3	4 ± 1.6	0.67	6	0.4	0.14
C 17	164	171	183	236	225	1	4 ± 0	1	2 ± 0	0.50	8	0.9	1.00
C 18	164	170	181	-	223	6	3.3 ± 0.9	2	1 ± 0	0.30	7	0.1	0.33
C 19	164	172	181	-	223	1	5 ± 0	1	5 ± 0	1.00	6	0.1	1.00
C 20	164	173	-	-	-	0	-	0	-	-			-
C 21	164	170	177	-	-	8	3.9 ± 1.5	0	0	0			0
C 22	164	173	177	-	-	1	5 ± 0	0	0	0			0
C 23	164	170	181	-	225	1	10 ± 0	1	5 ± 0	0.50	10	2.4	1.00
C 24	164	166	171	232	223	9	2.8 ± 0.6	8	2.1 ± 0.8	0.75			0.89
Mean	164	171	180	227	224	4.7	4.0	2.7	2.2	0.55	8.6	1.4	0.57
SD	1.1	3.9	4.6	8.1	1.3	5.0	1.3	2.4	0.6	0.35	2.3	1.3	0.39

*Only two of the original three capsules developed and as the smallest died the mean value increased.

Phenological dates (Julian days):

P 1: Plots snow-free
P 2: First leaf bud burst
P 3: First stigma visible
P 4: Onset of seed dispersal
P 5: First yellowing of leaves

Quantitative measurements:

Q 1: Total number of flowering catkins per monitoring unit
Q 2: Number of flowers in each catkin (mean ± SD)
Q 3: Total number of mature catkins per monitoring unit
Q 4: Number of capsules in each catkin (mean ±SD)
Q 5: Fruit/Flower ratio (Q 4/Q 2) (mean ± SD)
Q 6: Length of longest leaf (including petiole) (mm)
Q 7: Weight of largest leaf (with petiole) (mg)
Q 8: Mature catkin/Flowering catkin (Q 3/Q1)

***Salix rotundifolia* Trautv., male plants**

Experimental plots

No.	P1	P3	P4	P5	Q1	Q2
E 1	164	-	-	-		
E 2	164	-	-	-		
E 3	164	-	-	-		
E 4	169	-	-	-		
E 5	167	-	-	-		
E 6	167	187	190	230	7	1.7
E 7	168	187	194	225	12	1.8
E 8	164	184	187	225	7	1.0
E 9	164	-	-	-		
E 10	164	177	180	225	12	*
E 11	164	173	180	223	13	6.1
E 12	164	177	180	223	10	3.2
E 13	164	178	181	-	7	1.4
E 14	164	-	-	-		
E 15	164	177	177	229	8	2.4
E 16	164	173	173	223		
E 17	164	180	182	223	11	3.1
E 18	164	180	183	223	6	0.1
E 19	164	181	182	-		
E 20	164	185	187	-	7	1.5
E 21	164	181	183	223		
E 22	164	181	183	231	8	1.3
E 23	164	181	185	223	6	1.4
E 24	164	184	187	-	8	1.1
Mean	164.3	180.3	183.2	225.1	8.7	2.0
SD	1.4	4.1	4.8	2.8	2.3	1.4

* Partly eaten by insect larvae

Phenological dates (Julian days):

P 1: Plots snow-free
P 2: See female data sheet
P 3: First pollen shed
P 4: All pollen shed of the first flowering catkin
P 5: First yellowing of leaves

Quantitative measurements:

Q 1: Length of longest leaf (cm)
Q 2: Weight of largest leaf (mg)

***Salix rotundifolia* Trautv., male plants**

Control plots

No.	P1	P3	P4	P5	Q1	Q2
C 1	164	188	190	221	10	1.4
C 2	164	188	190	223	9	1.1
C 3	164	185	191	223	6	0.4
C 4	164	190	192	223	8	1.3
C 5	168	190	191	221	6	0.5
C 6	168	191	196	225	11	3.4
C 7	164	-	-	-		
C 8	164	191	191	223	7	0.7
C 9	164	-	-	-		
C 10	164	181	187	223	7	0.5
C 11	164	184	189	223	9	3.3
C 12	164	184	187	223	6	0.3
C 13	164	182	183	223	9	1.0
C 14	164	173	173	223	11	1.9
C 15	164	-	-	-		
C 16	164	181	182	225		
C 17	164	187	191	223	7	0.3
C 18	164	-	-	-		
C 19	164	185	187	223	11	2.8
C 20	164	187	189	223	8	1.7
C 21	164	188	191	230	7	1.1
C 22	164	187	191	223	9	1.2
C 23	164	187	188	223	7	0.8
C 24	164	181	183	225	7	1.1
Mean	164.3	185.5	188.1	223.5	8.3	1.3
SD	1.1	4.3	4.8	1.8	1.7	0.9

Phenological dates (Julian days):

P 1: Plots snow-free
P 2: See female data sheet
P 3: First pollen shed
P 4: All pollen shed of the first flowering catkin
P 5: First yellowing of leaves

Quantitative measurements:

Q 1: Length of longest leaf (cm)
Q 2: Weight of largest leaf (mg)

Appendix 7. Quantitative measurements of *Salix rotundifolia*: Number of flowers (Q 2) and capsules (Q 4).

Experimental plots

Plot #	Number of flowers in catkins (Q 2)	Mean (Q 2)	SD (Q 2)	Number of capsules in catkins (Q 4)	Mean (Q 4)	SD (Q 4)
E 1	2, 6, 10	6	3.3	8, 2	5.0	3
E 2	6, 5, 5, 7, 7, 5, 4	5.6	1	2, 6, 3	3.7	1.7
E 3	0	0	0	0	0	0
E 4	7, 7	7	0	5, 1	3	2
E 5	4	4	0	2	2	0
E 6	5	5	0	0	0	0
E 7	0	0	0	0	0	0
E 8	0	0	0	0	0	0
E 9	6, 5, 7, 3, 3, 7, 2, 6	4.9	1.8	3, 1, 3, 4, 4, 1, 1	2.4	1.3
E 10	5	5	0	4	4	0
E 11	0	0	0	0	0	0
E 12	0	0	0	0	0	0
E 13	6	6	0	0	0	0
E 14	5, 6, 3, 3, 5	4.4	1.2	3, 3, 3, 5, 5	3.8	1
E 15	4	4	0	0	0	0
E 16	6, 5	5.5	0.5	3	3	0
E 17	7, 2, 4	4.3	2.1	2, 1	1.5	0.5
E 18	6, 4, 5, 6, 5, 7, 6	5.6	0.9	3, 3, 5, 3	3.5	0.9
E 19	6, 7	6.5	0.5	3	3	0
E 20	0	0	0	0	0	0
E 21	3, 6, 4, 5	4.5	1.1	5, 6, 2, 1	3.5	2.1
E 22	8, 8, 7, 6, 6, 6, 6, 4, 5, 5, 3	5.8	1.5	3, 4, 4, 5, 5, 2, 3	3.7	1
E 23	5, 7, 5	5.7	0.9	0	0	0
E 24	6, 6, 2, 2, 4, 4, 5, 4, 4	4.1	1.4	5, 3	4	1
	Mean	5.2	0.7		1.9	0.9

Control plots

Plot #	Number of flowers in catkins (Q 2)	Mean (Q 2)	SD (Q 2)	Number of capsules in catkins (Q 4)	Mean (Q 4)	SD (Q 4)
C 1	8, 3	5.5	2.5	3, 5	4	1
C 2	7, 6, 9, 5, 3, 8, 9	6.7	2.1	4, 7, 3	4.7	1.7
C 3	0	0	0	0	0	0
C 4	4, 4, 5	4.3	0.5	0	0	0
C 5	2, 4, 1, 6	3.3	1.9	5, 3, 1	3	1.6
C 6	6, 3, 4	3.3	1.2	5, 2	3.5	1.5
C 7	2, 4	3	1	3, 2	2.5	0.5
C 8	4, 7, 8	6.3	1.7	5, 7	6	1
C 9	9, 3, 11	7.7	3.4	0	0	0
C 10	0	0	0	0	0	0
C 11	0	0	0	0	0	0
C 12	0	0	0	0	0	0
C 13	3, 5	4	1	2	2	0
C 14	8, 4, 6, 6, 5, 6, 5, 6, 7, 4, 4	5.5	1.2	3, 3, 2, 4, 5, 5, 6, 5, 6	4.3	1.3
C 15	6	6	0	3	3	0
C 16	6, 7, 9, 7, 7, 9, 6, 5, 7, 8, 7, 6, 7, 6, 3, 8, 8, 6, 2, 2, 5, 6	6	2.0	6, 4, 2	4	1.6
C 17	4	4	0	2	2	0
C 18	4, 3, 3, 5, 2, 3	3.3	0.9	1, 1	1	0
C 19	5	5	0	5	5	0
C 20	0	0	0	0	0	0
C 21	5, 6, 3, 1, 3, 5, 5, 3	3.9	1.5	0	0	0
C 22	5	5	0	0	0	0
C 23	10	10	0	5	5	0
C 24	3, 3, 3, 3, 2, 4, 2, 2, 3	2.8	0.6	2, 2, 3, 2, 3, 1, 3, 1	2.1	0.8
	Mean	4.0	1.3		2.2	0.6

Appendix 8. Phenological and quantitative measurements of the most abundant non-ITEX species.

***Arctagrostis latifolia* (R. Br.) Griseb.**

Experimental plots

No.	P1	P2	P3
E 1	168	-	-
E 2	168	-	-
E 3	171	205	232
E 4	-	-	-
E 5	170	192	228
E 6	-	209	-
E 7	-	-	-
E 8	-	-	-
E 9	-	-	-
E 10	-	-	-
E 11	166	-	-
E 12	172	-	-
E 13	-	-	-
E 14	-	-	-
E 15	166	192	-
E 16	166	189	223
E 17	166	-	-
E 18	167	-	-
E 19	-	-	-
E 20	-	-	-
E 21	-	-	-
E 22	-	-	-
E 23	-	-	-
E 24	166	191	-
Mean	167.8	197.4	227.7
SD	2.1	7.7	3.7

Control plots

No.	P1	P2	P3
C 1	167	215	-
C 2	166	208	-
C 3	168	205	-
C 4	168	-	-
C 5	171	-	-
C 6	-	-	-
C 7	176	-	-
C 8	167	-	-
C 9	168	-	-
C 10	166	196	-
C 11	166	-	-
C 12	-	-	-
C 13	166	-	-
C 14	166	-	-
C 15	168	-	-
C 16	-	-	-
C 17	-	-	-
C 18	170	-	-
C 19	-	-	-
C 20	-	-	-
C 21	169	-	-
C 22	-	-	-
C 23	-	-	-
C 24	-	-	-
Mean	168.1	206.0	-
SD	2.6	6.8	-

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: Inflorescence expanding

Luzula arctica **Blytt**

Experimental plots **Control plots**

No.	P1	P2	P3	P4	Q1	No.	P1	P2	P3	P4	Q1
E 1	166	174	182	190	7.7	C 1	168	-	182	190	10.8
E 2	166	173	176	192	8.4	C 2	-	180	185	194	5.9
E 3	169	-	-	-	6.4	C 3	167	-	184	192	-
E 4	169	180	183	192	10.2	C 4	167	178	183	192	5.4
E 5	169	178	184	192	8.9	C 5	170	180	185	192	5.1
E 6	170	174	180	190	8.9	C 6	168	-	-	-	-
E 7	169	174	180	190	11.0	C 7	169	-	-	-	-
E 8	166	173	178	192	10.1	C 8	166	178	185	191	6.5
E 9	166	174	184	192	10.3	C 9	166	-	-	-	-
E 10	166	-	-	-	-	C 10	166	-	173	189	-
E 11	-	-	-	-	-	C 11	166	173	188	191	4.0
E 12	166	174	182	192	14.4	C 12	166	172	180	192	4.5
E 13	-	-	-	-	-	C 13	166	178	182	189	12.4
E 14	166	-	-	-	-	C 14	166	174	-	-	-
E 15	-	-	-	-	-	C 15	166	174	185	196	8.5
E 16	166	176	184	189	8.2	C 16	-	-	-	-	-
E 17	166	173	174	189	15.4	C 17	167	178	187	199	6.6
E 18	167	-	-	-	-	C 18	-	-	-	-	-
E 19	166	174	183	189	11.2	C 19	-	-	-	-	-
E 20	-	-	-	-	-	C 20	-	-	-	-	-
E 21	-	-	189	196	4.0	C 21	-	-	-	-	-
E 22	-	-	-	-	-	C 22	-	-	-	-	-
E 23	-	-	193	196	-	C 23	166	182	189	198	-
E 24	166	-	-	-	-	C 24	-	-	-	-	-
Mean	167.0	174.8	182.3	191.5	9.7	Mean	166.9	177.0	183.7	192.7	7.0
SD	1.5	2.1	4.7	2.2	2.8	SD	1.2	3.1	3.9	3.1	2.6

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: First stigma visible
P 4: Stigma withering

Quantitative measurements (cm):

Q1: Mean length of pedicel

***Luzula confusa* Lindeb.**

Experimental plots **Control plots**

No.	P1	P2	P3	P4	Q 1	No.	P1	P2	P3	P4	Q 1
E 1	168	185	187	192	16.6	C 1	172	182	194	199	10.3
E 2	170	184	188	201	-	C 2	171	184	192	201	9.9
E 3	166	184	196	211	14.5	C 3	170	176	191	201	10.2
E 4	172	-	197	211	-	C 4	172	-	-	-	10.0
E 5	-	194	200	212	7.5	C 5	172	182	188	196	12.7
E 6	-	-	-	-	-	C 6	170	193	199	223	5.3
E 7	-	-	-	-	-	C 7	170	191	200	223	5.5
E 8	-	185	187	201	12.9	C 8	172	193	198	200	-
E 9	166	189	192	211	8.4	C 9	169	182	194	200	6.2
E 10	170	182	184	197	11.5	C 10	166	-	-	-	-
E 11	167	178	183	193	17.1	C 11	167	-	-	-	-
E 12	172	180	181	197	9.9	C 12	166	-	-	-	-
E 13	166	180	185	194	-	C 13	167	-	174	201	10.7
E 14	168	182	183	196	11.6	C 14	166	178	182	198	6.6
E 15	166	180	184	194	15.1	C 15	169	184	188	199	5.0
E 16	166	178	184	189	10.5	C 16	166	180	191	194	7.3
E 17	169	-	-	-	-	C 17	166	181	197	206	6.1
E 18	169	180	182	194	13.8	C 18	167	176	194	202	7.8
E 19	170	180	182	197	12.7	C 19	169	180	196	205	5.2
E 20	172	181	191	202	10.0	C 20	171	181	193	198	10.2
E 21	170	183	189	197	10.8	C 21	169	183	196	204	9.3
E 22	169	-	187	196	9.9	C 22	171	178	196	202	5.7
E 23	169	174	178	196	9.6	C 23	170	178	187	196	10.1
E 24	167	181	185	196	11.8	C 24	167	183	194	202	7.9
Mean	168.6	182.1	186.9	198.9	11.9	Mean	169.0	182.4	192.2	192.2	8.1
SD	2.0	4.2	5.5	6.7	2.6	SD	2.2	4.9	6.0	6.0	2.3

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: First stigma visible
P 4: Stigma withering

Quantitative measurements (cm):

Q 1: Mean length of pedicel

Poa arctica **R. Br.**

Experimental plots

No.	P1	P2	P3
E 1	166	-	-
E 2	169	207	226
E 3	168	206	223
E 4	169	-	-
E 5	169	207	223
E 6	170	209	223
E 7	170	209	225
E 8	169	209	218
E 9	167	199	220
E 10	169	200	-
E 11	167	-	-
E 12	167	-	-
E 13	167	206	225
E 14	169	-	-
E 15	167	193	223
E 16	167	-	-
E 17	-	-	-
E 18	167	-	-
E 19	167	-	-
E 20	169	-	-
E 21	169	-	-
E 22	168	176	-
E 23	169	-	-
E 24	169	201	230
Mean	168.2	201.8	223.6
SD	1.1	9.1	3.1

Control plots

No.	P1	P2	P3
C 1	168		
C 2	167	-	-
C 3	169	209	223
C 4	167	207	-
C 5	171	-	-
C 6	169	-	-
C 7	167	-	-
C 8	167	-	-
C 9	166	-	-
C 10	166	-	-
C 11	167	-	-
C 12	-	-	-
C 13	-	-	-
C 14	168	201	214
C 15	167	-	-
C 16	166	-	-
C 17	169	-	-
C 18	167	201	-
C 19	169	-	-
C 20	169	206	-
C 21	168	-	-
C 22	167	-	-
C 23	167	-	-
C 24	167	-	-
Mean	167.6	204.8	218.5
SD	1.2	3.2	4.5

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Inflorescence visible
P 3: Inflorescence expanding

Potentilla hyparctica **Malte**

Experimental plots **Control plots**

No.	P1	P2	P3	P4	Q 1	No.	P1	P2	P3	P4	Q 1
E 1	166	174	185	187	10.1	C 1	166	180	196	197	5.1
E 2	172	-	196	197	8.2	C 2	172	184	196	197	5.4
E 3	166	-	192	193	8.1	C 3	168	173	196	197	3.7
E 4	171	184	194	199	5.5	C 4	166	176	192	196	8.0
E 5	176	-	-	-	-	C 5	169	190	196	197	6.8
E 6	169	182	188	190	4.0	C 6	168	188	197	199	5.8
E 7	-	-	-	-	-	C 7	167	184	192	194	5.1
E 8	166	180	189	191	12.4	C 8	166	-	196	197	3.3
E 9	166	178	188	189	11.7	C 9	166	178	191	193	4.8
E 10	166	173	183	185	10.5	C 10	166	173	187	191	-
E 11	166	172	181	185	6.8	C 11	167	173	192	198	3.2
E 12	166	173	187	189	11.6	C 12	166	172	187	191	7.4
E 13	166	174	184	187	13.0	C 13	166	174	189	192	8.0
E 14	166	174	184	185	11.0	C 14	166	173	187	188	7.3
E 15	166	170	180	187	10.3	C 15	166	171	180	185	10.0
E 16	166	170	173	180	11.5	C 16	166	182	192	193	5.5
E 17	166	174	184	185	7.7	C 17	166	180	196	198	3.6
E 18	166	176	187	191	9.8	C 18	166	174	192	193	4.6
E 19	166	174	187	188	10.6	C 19	166	174	189	191	5.5
E 20	166	184	188	191	6.5	C 20	166	176	189	192	6.6
E 21	166	176	181	187	14.6	C 21	166	174	188	189	8.0
E 22	166	176	184	185	13.7	C 22	166	183	196	198	4.5
E 23	166	174	180	181	14.4	C 23	166	181	196	197	5.3
E 24	166	174	184	187	11.2	C 24	166	174	187	189	7.5
Mean	167.0	175.6	185.4	188.1	10.1	Mean	166.6	177.7	191.6	193.8	5.9
SD	2.5	4.0	4.9	4.4	2.8	SD	1.4	5.3	4.3	3.7	1.7

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Flower bud visible
P 3: Flowering
P 4: Elongation of pedicel

Quantitative measurements (cm):

Q 1: Mean length of pedicel

***Saxifraga punctata* L. ssp. *nelsoniana* (D. Don.) Hult.**

Experimental plots

No.	P1	P2	P3	P4	P5	Q 1
E 1	-	174	182	192	204	12.2
E 2	169	176	183	196	211	12.4
E 3	184	184	188	199	209	9.1
E 4	-	182	185	198	212	11.7
E 5	-	182	185	199	221	9.3
E 6	181	188	190	196	200	11.8
E 7	174	184	188	193	202	9.2
E 8	-	-	-	-	-	-
E 9	174	176	182	191	200	12.5
E 10	170	173	181	189	200	15.1
E 11	166	170	176	184	198	12.5
E 12	173	-	189	197	211	8.9
E 13	-	-	-	-	-	-
E 14	-	-	-	-	-	-
E 15	184	-	-	-	199	-
E 16	166	170	174	185	198	16.1
E 17	169	-	-	-	-	-
E 18	173	185	189	198	215	16.0
E 19	-	-	-	-	-	-
E 20	-	180	185	191	193	11.4
E 21	169	172	178	187	199	18.4
E 22	-	182	185	197	208	8.6
E 23	174	178	185	192	205	12.2
E 24	-	-	-	197	208	-
Mean	173.3	178.5	183.8	193.4	204.9	12.2
SD	5.7	5.5	4.5	4.7	6.9	2.8

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Flower bud visible
P 3: Elongation of pedicel
P.4: Flowering
P 5: Flower withering

Quantitative measurements (cm):

Q 1: Mean length of pedicel

***Saxifraga punctata* L. ssp. *nelsoniana* (D. Don.) Hult.**

Control plots

No.	P1	P2	P3	P4	P5	Q1
C 1	174	-	-	-	-	-
C 2	184	-	-	-	-	7.0
C 3	-	181	184	199	212	7.0
C 4	172	-	-	-	-	-
C 5	172	-	-	-	-	-
C 6	184	185	190	198	212	5.5
C 7	-	-	191	202	212	7.0
C 8	185	-	192	-	-	5.6
C 9	173	181	188	189	198	8.6
C 10	169	170	178	197	-	8.2
C 11	167	171	181	194	201	10.1
C 12	170	182	189	197	219	7.3
C 13	173	174	184	191	201	12.6
C 14	172	-	189	198	212	7.5
C 15	166	166	181	-	-	-
C 16	173	173	181	192	202	-
C 17	171	173	187	197	204	9.2
C 18	173	-	-	-	-	-
C 19	170	172	187	197	214	6.8
C 20	173	178	182	192	206	11.1
C 21	-	-	-	-	-	-
C 22	-	173	182	192	204	10.9
C 23	168	172	187	197	209	7.3
C 24	169	173	178	187	198	10.1
Mean	172.9	174.9	185.1	194.9	206.9	8.3
SD	5.3	5.1	4.3	3.9	6.2	2.0

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Flower bud visible
P 3: Elongation of pedicel
P 4: Flowering
P 5: Flower withering

Quantitative measurements (cm):

Q 1: Mean length of pedicel

***Stellaria laeta* Richards.**

Experimental plots

No.	P1	P2	P3	P4
E 1	166	184	212	223
E 2	166	193	-	-
E 3	167	-	-	-
E 4	169	221	-	-
E 5	168	-	-	-
E 6	168	-	-	-
E 7	168	212	228	-
E 8	166	-	-	-
E 9	166	183	-	-
E 10	167	183	230	-
E 11	167	182	198	216
E 12	166	215	223	233
E 13	167	-	-	-
E 14	167	192	230	236
E 15	166	174	182	204
E 16	166	-	-	-
E 17	166	193	-	-
E 18	166	212	-	-
E 19	167	184	198	202
E 20	166	200	230	-
E 21	166	187	232	-
E 22	167	188	-	-
E 23	166	185	-	-
E 24	168	215	-	-
Mean	166.8	194.6	216.3	219.0
SD	0.9	13.8	16.9	13.1

Control plots

No.	P1	P2	P3	P4
C 1	166	191	-	-
C 2	166	214	228	236
C 3	166	184	215	228
C 4	166	192	234	-
C 5	172	223	-	-
C 6	168	-	-	-
C 7	166	214	-	-
C 8	167	182	211	225
C 9	166	185	216	-
C 10	-	-	-	-
C 11	166	184	229	-
C 12	166	189	-	-
C 13	166	214	230	236
C 14	166	183	-	-
C 15	-	184	230	-
C 16	166	189	-	-
C 17	166	193	-	-
C 18	166	187	-	-
C 19	166	-	-	-
C 20	166	200	-	-
C 21	166	201	-	-
C 22	166	191	-	-
C 23	167	189	-	-
C 24	167	192	-	-
Mean	166.5	194.3	224.1	231.3
SD	1.3	11.8	8.1	4.9

Phenological dates (Julian days):

P 1: Emerging of first leaf
P 2: Flower bud visible
P 3: Flowering
P 4: Flower withering

Appendix 9. Quantitative measurements of the non-ITEX species. The lengths of the three longest pedicels were measured and the means are given.

	Luzula arctica				Luzula confusa				Papaver hultènii			
Plot #	1	2	3	Mean	1	2	3	Mean	1	2	3	Mean
E 1	7.3	5.7	10.2	7.7	19.5	15.0	15.4	16.6				-
E 2	10.6	6.5	8.2	8.4				-				-
E 3	6.4			6.4	17.2	12.2	14.2	14.5	23.0	21.0	21.0	21.7
E 4	10.2			10.2				-	31.5	30.0	30.0	30.5
E 5	9.1	8.5	9.2	8.9	9.0	5.9		7.5				-
E 6	12.5	7.5	6.8	8.9				-				-
E 7	10.7	11.2	11.0	11.0				-				-
E 8	10.5	8.0	11.8	10.1	13.0	12.5	13.2	12.9	14.6	17.5	13.5	15.2
E 9	12.2	9.0	9.6	10.3	7.5	9.2		8.4	19.2	20.0	17.8	19.0
E 10				-	11.0	11.6	12.0	11.5	11.7	12.5		12.1
E 11				-	17.1	18.0	16.2	17.1	14.0	14.5	14.5	14.3
E 12	14.4			14.4	11.0	8.5	10.2	9.9	9.5			9.5
E 13				-				-				-
E 14				-	13.0	12.6	9.2	11.6				-
E 15				-	15.5	15.2	14.5	15.1				-
E 16	9.5	7.7	7.5	8.2	14.5	11.6	5.3	10.5				-
E 17	15.4			15.4				-	19.8	19.5	17.6	18.7
E 18				-	14.0	14.1	13.2	13.8				-
E 19	11.2			11.2	13.4	12.1	12.6	12.7				-
E 20				-	7.9	10.8	11.4	10.0				-
E 21	4.0			4.0	11.1	11.4	9.8	10.8				-
E 22				-	10.2	10.5	9.1	9.9	11.4	14.0		12.7
E 23				-	10.2	10.0	8.5	9.6	17.2	16.6	16.2	16.7
E 24				-	13.1	12.9	9.5	11.8	16.2			16.2

	Luzula arctica				Luzula confusa				Papaver hultenii			
Plot #	1	2	3	Mean	1	2	3	Mean	1	2	3	Mean
C 1	10.8			10.8	9.8	11.4	9.6	10.3				-
C 2	5.7	6.0		5.9	11.1	10.0	8.6	9.9				-
C 3				-	12.0	9.7	9.0	10.2				-
C 4	7.0	4.8	4.4	5.4	10.0			10.0	12.1	14.0	14.0	13.3
C 5	5.5	4.6		5.1	13.0	12.2	13.0	12.7	10.2	9.6	9.8	9.9
C 6				-	5.0	5.6		5.3				-
C 7				-	5.5			5.5				-
C 8	6.5			6.5	*			-	14.0			14.0
C 9				-	8.2	4.2		6.2				-
C 10				-				-	11.0	9.4	9.5	10.0
C 11	4.0			4.0				-				-
C 12	3.2	5.8		4.5				-				-
C 13	9.6	10.1	17.6	12.4	10.1	11.5	10.5	10.7	15.9	16.0	15.8	15.9
C 14				-	6.5	6.6		6.6				-
C 15	9.2	8.3	8.0	8.5	5.0			5.0	8.3	9.3	8.7	8.8
C 16				-	8.1	6.5		7.3	8.0	9.2	9.5	8.9
C 17	6.6			6.6	6.4	5.8		6.1				-
C 18				-	9.0	6.0	8.3	7.8				-
C 19				-	5.8	4.5		5.2				-
C 20				-	10.7	10.5	9.5	10.2	14.1	13.2	11.0	12.8
C 21				-	8.6	10.5	8.7	9.3				-
C 22				-	6.2	5.2		5.7	5.3			5.3
C 23				-	10.4	10.0	9.8	10.1				-
C 24				-	10.3	5.5		7.9	10.3	9.4		9.9

	Potentilla hyparctica				Saxifraga punctata			
Plot #	1	2	3	Mean	1	2	3	Mean
E 1	10.0	10.1	10.2	10.1	11.1	10.6	15.0	12.2
E 2	8.8	7.6		8.2	12.4			12.4
E 3	8.6	7.8	8.0	8.1	9.8	7.0	10.4	9.1
E 4	5.0	6.0		5.5	11.6	13.0	10.5	11.7
E 5				-	10.0	9.8	8.0	9.3
E 6	4.0	4.2	3.8	4.0	14.5	11.5	9.5	11.8
E 7				-	10.0	8.3		9.2
E 8	12.2	11.6	13.5	12.4				-
E 9	11.2	12.6	11.2	11.7	12.5	16.4	8.6	12.5
E 10	10.5	10.5	10.5	10.5	17.7	12.5		15.1
E 11	8.4	6.0	6.0	6.8	12.5	12.5		12.5
E 12	11.0	12.8	11.0	11.6	8.3	9.5		8.9
E 13	14.0	13.0	12.0	13.0				-
E 14	11.5	11.0	10.5	11.0				-
E 15	10.0	11.0	10.0	10.3	*			-
E 16	12.5	11.0	11.0	11.5	17.1	17.5	13.8	16.1
E 17	7.2	9.8	6.2	7.7				-
E 18	11.5	9.4	8.5	9.8	16.0			16.0
E 19	11.6	10.3	9.8	10.6				-
E 20	7.1	6.3	6.2	6.5	12.3	11.0	10.8	11.4
E 21	15.0	14.8	14.1	14.6	18.9	18.6	17.6	18.4
E 22	13.5	14.0	13.6	13.7	8.6			8.6
E 23	14.5	13.8	15.0	14.4	12.2			12.2
E 24	12.2	11.3	10.2	11.2				-

	Potentilla hyparctica				Saxifraga punctata			
Plot #	1	2	3	Mean	1	2	3	Mean
C 1	6.0	5.1	4.2	5.1				-
C 2	7.5	3.2		5.4	8.0	6.0		7.0
C 3	3.5	3.5	4.0	3.7	7.0			7.0
C 4	9.2	7.2	7.6	8.0				-
C 5	7.6	7.2	5.6	6.8				-
C 6	5.5	6.0		5.8	5.4	5.6		5.5
C 7	4.8	4.5	6.0	5.1	7.0			7.0
C 8	3.5	3.0		3.3	5.2	6.5	5.2	5.6
C 9	4.1	5.5		4.8	10.2	6.5	9.2	8.6
C 10				-	8.2			8.2
C 11	3.2			3.2	7.2	12.5	10.5	10.1
C 12	7.6	7.3	7.4	7.4	7.3			7.3
C 13	8.1	8.5	7.5	8.0	12.5	13.6	11.8	12.6
C 14	8.4	8.4	5.2	7.3	7.5			7.5
C 15	10.3	9.8	10.0	10.0				-
C 16	6.7	5.2	4.5	5.5				-
C 17	4.2	3.0	3.5	3.6	10.1	8.8	8.6	9.2
C 18	5.6	3.1	5.2	4.6				-
C 19	5.6	6.1	4.8	5.5	6.3	7.0	7.1	6.8
C 20	8.0	6.1	5.8	6.6	11.6	10.6	11.0	11.1
C 21	9.0	8.0	7.1	8.0				-
C 22	5.2	4.3	4.0	4.5	11.0	10.1	11.6	10.9
C 23	5.9	5.8	4.1	5.3	8.2	5.6	8.2	7.3
C 24	8.5	7.6	6.3	7.5	10.1			10.1

Appendix 10. Phenological and quantitative measurements of the species monitored in the Meadow site.

Cardamine pratensis

P1: Plot snow-free
P2: Emergence of first leaf
P3: Emergence of stem
P4: First flower bud visible
P5: First flower visible

Q1: Length of longest leaf
Q2: Number of leaves
Q3: Length of flowering stem (in flower)
Q4: Number of flowers/buds

Carex aquatilis* ssp. *stans

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: First stigma visible
P5: First anther visible

Q1: Age class of shoot in flower
Q2: Length of flowering shoot
Q3: Number of green leaves
Q4: Length of longest green leaf
Q5: Number of brown tipped leaves
Q6: Number of individual shoots in the monitoring
Q7: Number of flowering stems in the monitoring unit

Cerastium beeringianum

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: First flower visible

Cochlearia officinalis

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: Elongation of pedicel
P5: First flower visible
P6: First capsule visible (longer than petals)

Q1: Diameter of rosette (green leaves only)
Q2: Length of flowering shoot
Q3: Number of siliques

Deschampsia caespitosa

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: Inflorescence expansion

Draba lactea

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: Elongation of pedicel
P5: First flower visible
P6: First silique visible (longer than petal)

Q1: Diameter of rosette
Q2: Length of flowering shoot
Q3: Number of siliques

Draba micropetala

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: Elongation of pedicel
P5: First flower visible
P6: First silique visible (longer than petal)

Dupontia fisheri

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: First stigma visible
P5: First anther visible

Q1: Length of longest leaf
Q2: Number of green leaves
Q3: Length of flowering shoot

Eriophorum russeolum

P1: Plot snow-free
P2: Emergence of first leaf
P3: Stem visible (different individual)
P4: Inflorescence visible
P5: First stigma visible
P6: First anther visible

Eriophorum triste

P1: Plot snow-free
P2: Emergence of first leaf
P3: Stem visible (different individual)
P4: Inflorescence visible
P5: First stigma visible
P6: First anther visible

Hierochloë pauciflora

P1: Plot snow-free
P2: Emergence of first leaf
P3: Stem visible (different individual)
P4: Inflorescence visible
P5: First stigma visible
P6: First anther visible

Juncus biglumis

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: First anther visible
P5: Withering of anthers
P6: Capsule visibly (emerging from outer caseing)

Q1: Length of flowering shoot

Q1: Length of longest leaf
Q2: Number of green leaves
Q3: Number of brown tiped leaves
Q4: Length of flowering shoot
Q5: Number of spikelets

Q1: Length of flowering shoot
Q2: Number of spikelets

Q1: Length of flowering shoot

Luzula arctica

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: First stigma visible
P5: Stigma withering

Q1: Length of longest green leaf
Q2: Length of flowering shoot

Luzula confusa

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: First stigma visible
P5: Stigma withering

Q1: Length of flowering shoot
Q2: Length of longest green leaf

Petasites frigidus

P1: Plot snow-free
P2: Emergence of first leaf

Poa arctica

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: Inflorescence expanding

Q1: Length of flowering shoot
Q2: Length of longest green leaf

Ranunculus nivalis

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: First flower emerging
P5: First petal shed

Ranunculus pygmaeus

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: First flower emerging
P5: First petal shed

Salix rotundifolia

P1: Plot snow-free
P2: Emergence of first leaf
P3: Stigma visible (female) or first pollen shed (male)
P4: Onset of seed dispersal

Saxifraga caespitosa

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: Elongation of pedicel
P5: First flower emerging

P6: First seed dispersal
P7: First yellowing of leaves

P6: First seed dispersal
P7: First yellowing of leaves

P5: First yellowing of leaves

Saxifraga cernua

P1: Plot snow-free
P2: Emergence of first leaf
P3: Stem visible
P4: First flower bud visible
P5: First flower emerging
P6: First yellowing of leaves

Q1: Width of widest leaf
Q2: Number of green leaves
Q3: Length of flowering shoot

Saxifraga foliolosa

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: Elongation of peduncel
P5: Length of internode longer than diameter of bud
P6: First flower emerging

Q1: Diameter of rosette (green leaves only)
Q2: Length of flowering shoot

Saxifraga hieracifolia

P1: Plot snow-free
P2: Emergence of first leaf
P3: Inflorescence visible
P4: Elongation of peduncel
P5: Length of internode longer than diameter of bud
P6: First flower emerging

Q1: Length of longest leaf
Q2: Number of leaves
Q3: Length of flowering shoot
Q4: Number of flowers

Saxifraga hirculus

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: First flower emerging

Q1: Number of buds or/and flowers in the monitoring unit
Q2: Length of flowering shoot

Stellaria laeta

P1: Plot snow-free
P2: Emergence of first leaf
P3: First flower bud visible
P4: First flower emerging

Appendix 11. Vegetation analyses of the biomass plots. The point-quadrate method has been used. Each plot consists of a northern and a southern half. BC = control plots, BE = experimental plots. The abbreviations of the species names are given below. Mosses were not identified by species.

Vascular plants:

Alopecurus alpinus Sm. ssp. *alpinus*	Aloalp
Arctagrostis latifolia (R. Br.) Griseb. var. *latifolia*	Arclat
Eriophorum angustifolium Honck. ssp. *triste* (Th. Fr.) Hult.	Eritri
Luzula confusa Lindeb.	Luzcon
Pedicularis sudetica Willd.	Pedsud
Petasites frigidus (L.) Franch.	Petfri
Poa arctica R. Br.	Poaarc
Salix pulchra Cham.	Salpul
Salix rotundifolia Trautv.	Salrot
Saxifraga punctata L. ssp. *nelsoniana* (D. Don.) Hult.	Saxpun
Saxifraga cernua L.	Saxcer
Senecio atropurpureus (Ledeb.) Fedtsch. ssp. *frigidus* (Richards) Hult.	Senatr
Stellaria laeta Richards.	Stelae

Lichens:

Cetraria cucullata (Bellardi) Ach.	Cetcuc
Cetraria islandica (L.) Ach.	Cetisl
Cetraria sp.	Cetsp
Dactylina arctica (Richard.) Nyl.	Dacarc
Peltigera sp.	Peltig
Stereocaulon sp.	Stereo
Thamnolia sp.	Thasp
Unidentified lichen	Lichen
Organic crust	Orgcru

Other categories: Fungus (Fungus), caribou dropping (Caribou), gravel, and bare ground (Bare ground).

Barrow 1995
ITEX point-quadrat data
Plot: BC 1 Date: August 12, 1995
North half of plot

Moss	Cladon	Moss	Carsta d.	Carsta d.	Carsta d.	Carsta d.	Moss	Carsta d.	Stelae
Dactyl	Moss	Moss	Moss	Saxpun	Moss	Carsta d.	Salrot d.	Salrot d.	Litter
Moss	Salrot	Carsta d.	Moss	Salrot	Carsta d.	Carsta d.	Litter	Moss	Cetsp
Moss	Aloalp	Moss	Carsta d.	Carsta d.	Carsta d.	Carsta d.	Cetrar	Cetrar	Carsta d.
Moss	Carsta d.	Moss	Carsta d.	Salrot	Salrot	Peltig	Litter	Litter	Carsta

Barrow 1995
ITEX point-quadrat data
Plot: BC 1 Date: August 12, 1995
South half of plot

Carsta d.	Salrot	Carsta d.	Moss	Carsta	Litter	Carsta d.	Moss	Salrot d.	Carsta d.
Moss	Carsta d.	Carsta d.	Senatr	Salrot	Carsta	Carsta d.	Carsta d.	Carsta	Salrot
Moss	Carsta d.	Salrot	Carsta	Moss	Aloalp	Salrot	Carsta	Carsta	Carsta Salrot
Carsta d.	Senatr	Moss	Thamn	Salrot	Salrot	Moss	Moss	Salrot	Moss
Salrot	Salrot	Saxpun	Litter	Moss	Moss	Moss	Thamn	Salrot	Carsta d.

Barrow 1995
ITEX point-quadrat data
Plot: BC 2 Date: August 12, 1995
North half of plot

Litter	Moss	Salrot	Salrot	Moss	Salrot	Moss	Moss d.	Moss	Carsta d.
Carsta d.	Carsta d.	Carsta d.	Salrot	Carsta d.	Moss	Moss	Dactyl	Carsta d.	Moss
Salrot d.	Peltig small	Carsta d.	Carsta d.	Salrot	Salrot	Carsta d.	Moss	Moss	Carsta d.
Salrot	Salrot	Salrot	Carsta d.	Salrot	Carsta d.	Salrot	Salrot	Salrot d.	Salrot
Salrot	Moss	Salrot	Carsta d.	Salrot	Moss	Salrot	Moss	Salrot	Moss

Barrow 1995
ITEX point-quadrat data
Plot: BC 2 Date: August 12, 1995
South half of plot

Carsta d.	Moss	Carsta	Moss	Salrot	Litter	Carsta d.	Moss	Salrot	Salrot
		Salrot							
Salrot	Carsta d.	Senatr	Moss	Carsta d.	Litter	Moss	Carsta d.	Salrot	Carsta
	Salrot								
Salrot	Carsta d.	Moss	Salrot	Moss	Litter	Carsta	Moss	Salrot	Carsta
						Salrot			
Litter	Carsta d.	Moss	Moss	Salrot	Moss	Carsta d.	Salrot	Moss	Moss
Carsta d.	Moss	Carsta d.	Carsta	Salrot	Moss	Litter	Carsta d.	Carsta	Carsta d.

Barrow 1995
ITEX point-quadrat data
Plot: BC 3 Date: August 12, 1995
North half of plot

Carsta d. ---	Carsta d. ---	Carsta d. ---	Moss ---	Carsta d. ---	Litter ---	Carsta d. ---	Salrot ---	Litter ---	Thamn ---
Carsta d. ---	Carsta d. ---	Carsta ---	Moss ---	Litter ---	Carsta d. ---	Salrot ---	Carsta d. ---	Carsta d. ---	Carsta d. ---
Salrot d. ---	Carsta d. ---	Carsta d. ---	Moss ---	Moss ---	Carsta d. ---	Carsta d. ---	Salrot ---	Carsta d. ---	Litter ---
Carsta ---	Carsta d. ---	Carsta d. ---	Carsta d. ---	Carsta d. ---	Carsta d. ---	Carsta ---	Carsta d. ---	Carsta d. ---	Moss ---
Carsta d. ---	Moss ---	Salrot ---	Carsta d. ---	Salrot ---	Moss ---	Carsta d. ---	Arclat ---	Salrot ---	Carsta d. ---

ITEX point-quadrat data
Plot: BC 3 Date: August 12, 1995
South half of plot

Carsta ---	Carsta d. ---	Carsta d. ---	Litter ---	Carsta d. ---	Carsta ---	Carsta d. ---	Salrot ---	Litter ---	Carsta ---
Carsta d. --- Salrot	Moss ---	Carsta ---	Saxcer ---	Carsta d. ---	Carsta d. ---	Carsta d. ---	Caribou ---	Salrot d. ---	Salrot ---
Salrot d. ---	Carsta ---	Carsta d. ---	Salrot ---	Salrot ---	Carsta ---	Salrot ---	Salrot ---	Carsta d. ---	Salrot ---
Carsta d. ---	Carsta d. ---	Carsta d. ---	Salrot ---	Carsta d. ---	Carsta --- Salrot	Salrot ---	Salrot ---	Carsta ---	Salrot ---
Saxcer ---	Moss ---	Salrot ---	Carsta ---	Carsta --- Moss	Salrot ---	Moss ---	Carsta d. ---	Moss ---	Carsta d. ---

Barrow 1995
ITEX point-quadrat data
Plot: BC 4 Date: August 12, 1995
North half of plot

Carsta ---	Carsta d. ---	Salrot ---	Salrot ---	Salrot ---	Carsta d. ---	Carsta d. ---	Moss ---	Carsta ---	Carsta d. ---
Carsta d. ---	Carsta d. ---	Salrot ---	Carsta d. ---	Moss ---	Moss ---	Moss ---	Cetcuc ---	Carsta ---	Thamn ---
Carsta ---	Salrot d. ---	Salrot d. ---	Carsta d. ---	Carsta d. ---	Dactyl ---	Carsta ---	Litter ---	Carsta ---	Carsta d. ---
Salrot d. ---	Moss ---	Carsta d. ---	Carsta ---	Salrot ---	Salrot d. ---	Salrot d. ---	Salrot ---	Salrot ---	Cetisl ---
Carsta d. ---	Carsta d. ---	Carsta ---	Carsta d. ---	Carsta d. ---	Carsta d. ---	Cetcuc ---	Cetisl ---	Carsta d. ---	Carsta d. ---

ITEX point-quadrat data
Plot: BC 4 Date: August 12, 1995
South half of plot

Carsta d.	Carsta	Moss	Carsta d.	Carsta d. Salrot	Carsta d.	Salrot	Litter	Carsta d.	Stelae d.
Salrot d.	Carsta	Litter	Carsta d.	Carsta d.	Salrot	Moss	Stelae d.	Carsta d. Carsta	Carsta Salrot
Litter	Aloapl	Carsta d.	Carsta	Carsta Carsta d.	Moss	Moss	Salrot	Salrot	Litter
Litter	Carsta	Carsta	Carsta d.	Carsta	Carsta	Carsta d.	Arclat	Moss	Cetisl
Salrot	Cetisl	Carsta d.	Carsta	Carsta d.	Carsta d.	Lichen white	Moss	Salrot	Carsta d.

ITEX point-quadrat data
Plot: BC 5 Date: August 12, 1995
North half of plot

Moss	Moss	Carsta	Salrot	Carsta d.	Carsta d.	Carsta	Moss	Moss	Moss
Carsta d.	Moss	Moss	Salrot	Carsta d.	Carsta	Salrot d.	Litter	Lichen	Carsta d.
Moss	Carsta	Carsta d.	Cetsp.	Carsta d.	Moss	Moss	Carsta d.	Salrot d.	Salrot d.
Moss	Moss	Carsta	Salrot	Cetsp.	Carsta d.	Carsta	Salrot	Salrot	Moss
Carsta d.	Poaarc	Moss	Carsta	Carsta	Moss	Carsta	Carsta d.	Moss	Moss

Barrow 1995
ITEX point-quadrat data
Plot: BC 5 Date: August 12, 1995
South half of plot

Carsta --- Salrot	Salrot ---	Moss ---	Carsta d. ---	Carsta ---	Carsta ---	Carsta ---	Moss ---	Litter ---	Litter ---
Carsta ---	Carsta d. ---	Salrot ---	Moss ---	Carsta ---	Moss ---	Carsta d. --- Moss	Salrot d. ---	Moss ---	Carsta ---
Salrot ---	Saxpun ---	Carsta d. ---	Salpul ---	Salpul ---	Carsta d. ---	Carsta ---	Carsta d. ---	Carsta ---	Poaarc ---
Salpul ---	Moss ---	Moss ---	Carsta d. ---	Salpul ---	Salpul ---	Litter ---	Salrot ---	Carsta d. ---	Carsta d. ---
Salpul ---	Salrot ---	Carsta ---	Carsta ---	Moss ---	Salrot d. ---	Salrot ---	Carsta ---	Salrot ---	Carsta d. ---

ITEX point-quadrat data
Plot: BC 6 Date: August 12, 1995
North half of plot

Carsta	Arclat	Moss	Moss	Orgcru black	Orgcru black	Carsta	Salrot d.	Salrot	Salrot d.
Carsta d.	Carsta d.	Carsta d.	Carsta d.	Poaarc	Moss	Carsta d.	Carsta d.	Salrot	Salrot d.
Carsta d.	Salrot	Carsta	Arclat	Salrot	Peltig small	Orgcru black	Moss	Moss	Carsta d.
Salrot d.	Moss	Salrot	Thasp	Moss	Salrot	Orgcru black	Peltig small	Salrot	Carsta d.
Moss	Moss	Salrot	Salrot	Salrot	Orgcru white	Carsta d.	Carsta d.	Stelae	Moss

Barrow 1995
ITEX point-quadrat data
Plot: BC 6 Date: August 12, 1995
South half of plot

Salrot	Moss	Moss	Carsta d.	Carsta	Moss	Carsta d.	Pedsud	Carsta d.	Carsta
			Salrot						
Carsta d.	Salrot	Carsta d.	Salrot	Carsta d.	Moss	Salrot d.	Carsta	Carsta	Carsta
Peltig small	Carsta	Carsta	Carsta	Carsta d.	Salrot	Moss	Carsta	Aloalp	Moss
	Salrot								
Carsta	Salrot	Litter	Moss	Salrot	Carsta	Carsta	Carsta d.	Moss	Salrot
Carsta	Salrot d.	Carsta d.	Carsta	Carsta	Moss	Salrot	Carsta d.	Carsta	Salrot
Salrot				Salrot					

ITEX point-quadrat data
Plot: BE 1 Date: August 13, 1995
North half of plot

Carsta d.	Cetsp	Litter	Dacarc	Luzcon d.	Moss	Moss	Peltig	Litter	Cetsp
Moss	Moss	Carsta	Carsta d.	Salrot	Carsta	Carsta d.	Thasp	Peltig d.	Salrot
Moss	Moss	Salrot	Moss	Cetsp	Carsta d.	Salrot d.	Poaarc	Moss	Eritri
Carsta d.	Moss	Moss	Cetsp	Dacarc	Arclat	Carsta d.	Moss	Salrot	Saxpun
Carsta	Arclat	Dacarc	Carsta d.	Salrot	Eritri	Eritri	Salrot	Pelfri	Carsta d.

Barrow 1995
ITEX point-quadrat data
Plot: BE 1 Date: August 13, 1995
South half of plot

Salrot	Salrot	Salrot	Carsta	Carsta d.	Carsta d.	Litter	Moss	Moss	Moss
Carsta d.	Moss	Moss	Carsta	Carsta	Carsta d. Salrot	Petfri	Carsta d.	Carsta d.	Carsta d.
Moss	Moss	Litter	Salrot	Carsta d.	Carsta d.	Salrot	Salrot	Salrot	Carsta
Moss	Carsta	Carsta	Carsta	Carsta	Moss	Carsta d.	Carsta d. Salrot	Carsta d.	Cetsp.
Aloalp	Moss	Carsta Salrot	Carsta d.	Salrot	Carsta d. Salrot	Saxpun	Salrot	Litter	Moss

ITEX point-quadrat data
Plot: BE 2 Date: August 13, 1995
North half of plot

Moss	Salrot	Carsta d.	Carsta d.	Moss	Luzcon	Dacarc	Stelae d.	Stelae d.	Dacarc
Moss	Moss	Dacarc	Luzcon	Carsta d.	Stelae d.	Moss	Carsta d.	Salrot	Dacarc
Thasp	Carsta	Stelae	Moss	Moss	Peltig	Salrot	Litter	Moss	Carsta d.
Carsta d.	Moss	Carsta d.	Moss	Salrot	Carsta d.	Dacarc	Carsta d.	Salrot	Stelae
Moss	Salrot	Stelae	Carsta d.	Salrot	Luzcon	Moss	Cetcuc	Carsta	Saxpun Dacarc

Barrow 1995
ITEX point-quadrat data
Plot: BE 2 Date: August 13, 1995
South half of plot

Carsta d.	Litter	Litter	Carsta	Salrot	Carsta Salrot	Carsta d.	Dacarc	Salrot	Carsta
Stelae d.	Carsta d.	Carsta d.	Moss	Carsta d.	Carsta d.	Carsta d.	Litter	Litter	Litter
Saxpun	Carsta d.	Saxpun	Moss	Salrot	Carsta	Moss	Salrot	Thasp	Salrot
Moss	Salrot	Carsta	Carsta d.	Carsta d.	Salrot	Carsta d.	Stelae d.	Salrot	Carsta
Moss	Thasp	Moss	Salrot	Carsta d.	Carsta d.	Salrot	Moss	Carsta d.	Carsta

Barrow 1995
ITEX point-quadrat data
Plot: BE 3 Date: August 13, 1995
North half of plot

Carsta d.	Saxpun	Carsta d.	Saxpun	Moss	Carsta d.	Moss	Carsta d.	Saxpun	Salrot
Catcuc	Salrot	Carsta d.	Litter	Salrot d.	Thasp	Litter	Moss	Thasp	Cetsp
Cetcuc	Carsta d.	Carsta d.	Salrot	Salrot d.	Moss	Carsta d.	Carsta d.	Dacarc	Carsta d.
Carsta d.	Stelae	Carsta d.	Carsta d.	Moss	Carsta	Moss	Carsta d.	Salrot	Moss
Carsta	Moss	Carsta d.	Salrot d.	Salrot	Moss	Carsta	Carsta d.	Carsta d.	Carsta d.

Barrow 1995
ITEX point-quadrat data
Plot: BE 3 Date: August 13, 1995
South half of plot

Carsta	Carsta d. Salrot	Salrot	Moss	Carsta	Carsta	Carsta d.	Carsta	Carsta d.	Carsta d.
Cetcuc	Carsta d.	Salrot	Litter	Moss	Moss	Salrot	Carsta d.	Litter	Carsta d.
Salrot d.	Moss	Carsta d.	Carsta d.	Carsta d.	Moss	Moss	Dacarc	Cetcuc	Dacarc
Cetsp	Thasp	Dacarc	Carsta d.	Carsta d.	Moss	Salrot	Moss	Carsta	Carsta d.
Salrot	Thasp	Salrot	Carsta d.	Cetsp	Carsta	Carsta d.	Cetcuc	Salrot	Moss

Barrow 1995
ITEX point-quadrat data
Plot: BE 4 Date: August 13, 1995
North half of plot

Carsta d.	Salrot d.	Salrot	Carsta d.	Carsta d.	Arclat	Carsta d.	Carsta d.	Salrot	Moss
Carsta d.	Salrot	Salrot	Dacarc	Arclat	Salrot	Carsta d.	Carsta d.	Litter	Salrot
Carsta d.	Carsta d.	Carsta d.	Carsta d.	Carsta	Carsta d.	Carsta d.	Salrot	Carsta d.	Salrot
Salrot	Litter	Carsta d.	Carsta d.	Carsta d.	Moss	Carsta d.	Salrot	Moss	Salrot
Litter	Carsta d.	Carsta	Moss	Carsta	Carsta d.	Carsta d.	Dacarc	Moss	Luzcon

Barrow 1995
ITEX point-quadrat data
Plot: BE 4 Date: August 13, 1995
South half of plot

Carsta d.	Salrot	Carsta d.	Carsta	Carsta d.	Litter	Moss	Moss	Salrot	Carsta
Salrot	Moss	Carsta d.	Litter	Carsta d.	Salrot	Salrot	Salrot	Carsta	Carsta d. Salrot
Salrot	Carsta	Carsta	Moss	Moss	Carsta d. Salrot	Salrot	Carsta d.	Carsta d.	Carsta
Moss	Carsta d.	Carsta d.	Carsta	Carsta d.	Carsta	Moss	Moss	Carsta d. Salrot	Salrot
Cetsp	Moss	Carsta d.	Salrot	Moss	Carsta	Salrot	Carsta d. Salrot	Carsta	Cetsp

Barrow 1995
ITEX point-quadrat data
Plot: BE 5 Date: August 13, 1995
North half of plot

Moss	Salrot	Moss	Salrot	Salrot	Salrot	Salrot	Moss	Carsta d.	Carsta d.
Salrot	Salrot	Carsta	Salrot	Carsta	Carsta d.	Stesp	Carsta d.	Carsta d.	Carsta d.
Carsta	Moss	Carsta	Carsta d.	Salrot	Moss	Moss	Carsta d.	Poaarc d.	Carsta d.
Carsta d.	Litter	Carsta d.	Salrot	Carsta d.	Carsta d.	Salrot	Salrot	Stelae	Salpul d.
Moss	Stelae	Carsta d.	Salrot	Salrot d.	Carsta	Stelae	Carsta d.	Cetsp	Fungus

Barrow 1995
ITEX point-quadrat data
Plot: BE 5 Date: August 13, 1995
South half of plot

Moss	Carsta d.	Carsta	Carsta	Salrot	Carsta	Carsta	Litter	Carsta d.	Salrot
Carsta	Carsta d.	Carsta d.	Carsta d.	Carsta d.	Salrot	Carsta Salrot	Carsta	Moss	Moss
Moss	Carsta d. Salrot	Salrot	Carsta d. Salrot	Salrot	Saxpun	Salrot	Carsta d.	Moss	Litter
Thasp	Salrot	Carsta	Salrot	Carsta	Moss	Carsta	Carsta d.	Moss	Moss
Carsta d.	Carsta	Moss	Carsta	Carsta	Moss	Carsta d.	Salrot	Moss	Salrot

Barrow 1995
ITEX point-quadrat data
Plot: BE 6 Date: August 13, 1995
North half of plot

Salrot	Salrot	Moss	Carsta d.	Carsta d.	Carsta	Carsta	Moss	Moss	Salrot
Moss	Moss	Carsta d.	Moss	Salrot	Moss	Salrot	Poaarc d.	Orgcru white	Salrot
Stelae	Salrot	Moss	Carsta	Aloalp	Moss	Moss	Moss	Salrot	Carsta
Carsta	Moss	Moss	Cetcuc	Moss	Moss	Salrot	Moss	Carsta d.	Moss
Salrot d.	Cetsp	Salrot	Moss	Carsta d.	Carsta	Carsta d.	Carsta d.	Salrot d.	Carsta d. Litter

Barrow 1995
ITEX point-quadrat data
Plot: BE 6 Date: August 12, 1995
South half of plot

Salrot	Aloalp	Moss	Thasp	Carsta	Carsta d.	Carsta d.	Carsta d.	Carsta	Carsta
Carsta d.	Moss	Salrot	Salrot	Arclat d.	Carsta	Litter	Moss	Carsta	Carsta
Salrot d.	Moss	Salrot	Carsta d. Salrot	Carsta d.	Carsta d.	Litter	Carsta	Carsta d.	Carsta
Salrot	Salrot	Salrot	Moss	Carsta	Bare ground	Carsta Salrot	Carsta d.	Carsta d. Salrot	Salrot
Salrot	Salrot	Carsta	Salrot	Carsta d.	Carsta d.	Carsta d.	Carsta	Salrot	Carsta

Appendix 12. Vegetation analyses of the plots at the Ridge site. The point-quadrat method has been used. Each plot consists of a northern and a southern half. E = experimental plot, C = control plot. The abbreviations of the species names are given below. Nomenclature for vascular plants, mosses, and lichens follow that of Hultén 1968, Anderson et al. 1990, and Esslinger and Egan 1995, respectively.

Vascular plants:

Alopecurus alpinus Sm. ssp. *alpinus*	Aloalp
Arctagrostis latifolia (R. Br.) Griseb. var. *latifolia*	Arclat
Luzula arctica Blytt	Luzarc
Luzula confusa Lindeb.	Luzcon
Papaver hultenii Knaben	Paphul
Pedicularis kanei Durand	Pedkan
Pedicularis sudetica Willd.	Pedsud
Poa arctica R. Br.	Poaarc
Salix rotundifolia Trautv.	Salrot
Saxifraga punctata L. ssp. *nelsoniana* (D. Don.) Hult.	Saxpun
Saxifraga cernua L.	Saxcer
Senecio atropurpureus (Ledeb.) Fedtsch. ssp. *frigidus* (Richards) Hult.	Senatr
Stellaria laeta Richards.	Stelae
Vaccinium vitis-idaeus L. ssp. *minus* (Lodd.) Hult	Vaccit

Lichens:

All *Dactylina* material is called *D. arctica* (Dacarc), but *D. ramulosa* was found at the site by B. Murray.
Yellow *Cetraria* is identified as *C. cuculata*.
Brown *Cetraria* with "hairs" is called *C. islandica*.
Brown *Cetraria* without "hairs" is called *Cetraria* sp.

Alectoria nigricans (Ach.) Nyl.	Alenig
Cetraria cucullata (Bellardi) Ach.	Cetcuc
Cetraria islandica (L.) Ach.	Cetisl
Cetraria sp.	Cetsp
Cladonia spp.	Cladon
Dactylina arctica (Richard.) Nyl.	Dacarc
Ochrolechia frigida (Sw.) Lynge	Ochfri
Parmelia skultii Hale	Parsku
Peltigera sp.	Pelsp
Psoroma hypnorum (Vahl) S. Gray	Psohyp
Sphaerophorus globosus (Huds.) Vain.	Sphglo
Stereocaulon sp.	Stesp
Thamnolia sp.	Thasp

Unidentified lichen	Lichen
Organic crust (cryptogamic crust)	Orgcru

Mosses incl. Hepatics:

Anastrophyllum ? *minutum*?	Ana?mi
Aulacomnium turgidum (Wahlenb.) Schwägr.	Aultur
Bartramia ithyphylla Brid.	Barith
Bryum sp.	Brysp
Conosomum tetragonum (Hedw.) Lindb.	Contet
Dicranella sp.	Dicransp
Dicranum sp.	Dicsp
Diplophyllum sp.	Diplsp
Distichium capillaceum (Hedw.) Brunch, Schimp. & W.Gümbel	Discap
Gymnomitrion cf. coralloides Nees	Gym?co
Hylocomium splendens (Hedw.) Schimp. in Brunch, Schimp. & W.Gümbel	Hylspl
Hypnum sp.	Hypnsp
Oncophorus wahlenbergii Brid.	Oncwah
Pohlia sp.	Pohsp
Polytrichastrum alpinum (Hedw.) G.L.Sm.	Polalp
Polystrichum strictum Brid.	Polstr
Polytrichum sp.	Polysp
Ptilidium ciliare (L.) Hampe	Pticil
Racomitrium lanuginosum (Hedw.) Brid.	Raclan
Sanionia uncinata Hedw.	Sanunc
Timmia austriaca Hedw.	Timaus
Tomnethypnum nitens (Hedw.) Loeske	Tomnit

Other categories: Leafy hepatics (Hepatic), Fungus (Fungus), caribou dropping (Caribou), litter, gravel, stone, and bare ground.

Barrow 1995
ITEX point-quadrat data
Plot: E 1 Date: August 8, 1995
North half of plot

C 12.0 **D 11.0**

Salrot 13	Litter 13	Castet 11	Castet 11	Castet 12	Litter 14	Castet d. 14	**Tag** 15	Pothyp 13	Luzcon d. 11.5
Castet 13.5	Salrot d. 14	Cetcuc 14	**Tag** 14	Litter 14	Arclat 11 Litter 15	Litter 15	Castet 14	Poaarc 11.5 Alenig 13.5	Luzcon 11.5
Cetcuc 16.5	Litter 16	Cetcuc 15	Litter 15	Litter 14.5	Litter 15	Castet 14.5	Cetcuc 15	Arclat 14.5	Cetcuc 15.5
Raclan 18.5	Thasp 17	Castet 16	Stelae d. 14	Castet 14	Castet d. 16	Castet 15	Hylspl 14	Salrot 14	Salrot 13
Stelae d. 17.5	Castet 15	Castet 14	Castet d. 15.5	Castet 15	Castet 16	Castet 15	Salrot 14.5	Pothyp 14	Salrot 13

A 24.0 **B 21.0**

Barrow 1995
ITEX point-quadrat data
Plot: E 1 Date: August 14, 1995
South half of plot

Castet d. 19	Castet d. 17.5	Dicsp 16	Cetcuc 15.5	Castet 16.5	Castet 17	Salrot d. 16.5	Salrot 18	Salrot 18	Salrot d. 18
Castet d. 18	Castet 16	Castet 15	Castet 15	Bare ground 18.5	Stone 18.5	Salrot 18	Salrot 19	Salrot 19	Salrot d. 18
Castet 17	Castet 15	Salrot 16.5	Litter 19	Stone 18	Stone 19	Salrot 18.5	Dicsp d. 19	Polalp 18	Salrot 18
Alenig 20.5	Corlin 18	Salrot 17.5	Dacarc 18	**Tag** 18.5	Salrot 17	Salrot 17	Aultur 18	Salrot 18	Pothyp
Litter 23.5	Litter 22	Luzcon d. 19.5	Litter 19	Bare ground 19	Salrot 19.5	Orgcru white 17.5	Pothyp 19	Salrot 20	Salrot 20.5

Barrow 1995
ITEX point-quadrat data
Plot: E 2 Date: August 8, 1995
North half of plot

C 9.0 **D 7.0**

Dicsp d. 13.5 ---	Salrot 16 ---	Thasp 16.5 ---	Cetcuc 12 ---	Litter 12 ---	**Tag** 11.5 ---	Alenig 8.5 ---	Thasp 8.5 ---	Castet 7.5 ---	Castet 8 ---
Cetsp 16 ---	Litter 16.5 ---	**Tag** 17 ---	Castet d. 16.5 ---	Castet 15 ---	Orgcru white 12.5 ---	Alenig 11 ---	Castet 10 ---	Alenig 10.5 ---	Castet 10.5 ---
Litter 16 ---	Castet 13.5 --- Castet d. 17.5	Castet 15 ---	Castet 12 ---	Castet 12 ---	Litter 13 ---	Thasp 12.5 ---	Thasp 13 ---	Castet 10 --- Thasp 13.5	Litter 12.5 ---
Castet 15 ---	Castet 16 ---	Castet 19 ---	Salrot d. 14 ---	Luzarc 12.5 ---	Castet 12 ---	Castet 12 ---	Castet d. 12.5 ---	Castet d. 13 ---	Alenig 12 ---
Castet 18 ---	Castet d. 19.5 ---	Castet 19 ---	Castet 15.5 ---	Castet 12.5 ---	Castet 13 ---	Castet 12 ---	Luzarc d. 11.5 ---	Castet d. 12.5 ---	Castet 10 ---

A 24.0 **B 17.5**

Barrow 1995
ITEX point-quadrat data
Plot: E 2 Date: August 14, 1995
South half of plot

Castet d. 21 ---	Alenig 18 ---	Casstet 15 ---	Polalp 15 ---	Polalp 14 ---	Litter 14 ---	Castet 13.5 ---	Castet 11.5 ---	Castet 12 ---	Alenig 13 ---
Castet 20.5 ---	Litter 21 ---	Cetcuc 18 ---	Dacarc 18 ---	Litter 18.5 ---	Litter 16.5 ---	Luzarc d. 14 ---	Salrot 13.5 ---	Cetsp 14 ---	Sphglo 16 ---
Litter 21.5 ---	Luzarc d. 19.5 ---	Litter 18.5 ---	**Tag** 21 ---	Saxpun 18.5 ---	Dicsp 17 ---	Castet d. 15.5 ---	Castet 15 ---	Litter 20 ---	Salrot 17 ---
Castet 19.5 ---	Litter 20 ---	Lichen 20 ---	Salrot 20.5 ---	Petsp 21.5 ---	Luzcon 18 ---	Salrot 17.5 ---	Salrot 17 ---	Salrot 17 ---	Salrot 16.5 ---
Castet 20.5 ---	Orgcru 22.5 ---	Thasp 20.5 ---	Salrot 21 ---	Castet 21 ---	Dacarc 22 ---	Luzcon d. 19 ---	Sal 18.5 ---	Orgcru 18 ---	Salrot 17 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 3 Date: August 11, 1995
North half of plot

C 17.6 **D 17.1**

Salrot 20	Poaarc d. 20	Litter 22	Cetsp 23	Litter 22	Thasp 23	Hylspl 21	Castet 17	Poaarc d. 17	Castet d. 17.5
Stelae 20	Castet d. 21	Poaarc 22	**Tag** 23	Orgcru black 23.5	Dacarc 21.5	Castet 19	Castet 18	Castet d. 19	Litter 19
Luzcon d. 20	Litter 21.5	Hepatic leafy 23.5	Poaarc d. 23	Hylspl 24	Castet 18.5	Dacarc 19	Dacarc 20	Raclan 20.5	Castet d. 20
Luzcon d. 21.5	Saxpun 22.5	Salrot 23.5	Castet 22.5	Thasp 22.5	Hylspl 22	Castet 18.5	Luzcon d. 18	Castet 19.5	Castet 19
Salrot 20.5	Salrot 23	Castet 23.5	Castet 22	Castet 20	Paplap 19.5	Rhalan 21	Litter 23	Litter 21.5	Castet 21.5

A 24.5 **B 21.4**

Barrow 1995
ITEX point-quadrat data
Plot: E 3 Date: August 11, 1995
South half of plot

Salrot d. 22 ---	Thasp 21 ---	Saxpun 22.5 ---	Castet 20 ---	Dacarc 20 ---	Litter 21 ---	Thasp 22 ---	Hepatic leafy 23 ---	Thasp 21.5 ---	Castet d. 21 ---
Arclat 15.5 --- Litter 23.5	Litter 24 ---	Pothyp 22 ---	Hylspl 21.5 ---	Litter 21 ---	Thasp 21 ---	Hylspl 21 ---	Thasp 21 ---	Castet 20 ---	Castet 20 ---
Litter 23.5 ---	Arclat 10 --- Litter 23.5	Litter 23.5 ---	Hylspl 20.5 ---	Dicsp 22 ---	Litter 21.5 ---	Orgcru white 20 ---	Alenig 19.5 ---	Castet d. 23 ---	Castet d. 22 ---
Litter 25.5 ---	**Tag** 24 ---	Litter 24 ---	Dacarc 23 ---	Castet 20.5 ---	Litter 20.5 ---	Salrot d. 19.5 ---	Salrot d. 21 ---	Castet 19 ---	Castet 21 ---
Thasp 26 ---	Litter 23.5 ---	Litter 26 ---	Litter 27 ---	Salrot 23 ---	Salrot 21 ---	Thasp 20 ---	**Tag** 21 ---	Salrot 21.5 ---	Castet 20.5 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 4 Date: August 12, 1995
North half of plot

C 30.6 **D 25.7**

Salrot 33	Cetcuc 29	**Tag** 29.5	Castet 28	Castet 27	Cetcuc 27	Salrot 28	Cetcuc 27	Moss 28	Salrot 27
Dicsp 34	Salrot 31	Salrot 30	Castet 25.5 Castet 29	Cetsp 29.5	Castet 27	Litter 28	**Tag** 27	Cetso 26.5	Alenig 26
Salrot 35.5	Pelsp? 32	Orgcru black 31	Castet 30	Tomnit 30	Salrot 28	Salrot d. 27	Salrot 26	Alenig 27	Castet 27
Arclat 30 Raclan 34.5	Luzcon d. 30 Alenig 31.5	Castet 29	Castet d. 27	Dicsp 30	Salrot 29	Luzarc 27.5	Salrot 27.5	Cetcuc 27	Cetsp 27
Salrot 34.5	Junbig 32	Salrot 32	Litter 33	Hole	Salrot d. 29.5	Alenig 28	Alenig 28	Alenig 27	Stelae d. 27

A 32.8 **B 27.5**

Barrow 1995
ITEX point-quadrat data
Plot: E 4 Date: August 12, 1995
South half of plot

Lichen white 34.5	Salrot 33.5	Cetsp 33.5	Castet 33	Lichen white 30.5	Moss d. 27.5	Thasp 29.5	Alenig 27	Dacarc 28	Castet 27
Lichen white 34.5	Salrot 33	Dicsp 33	Dicsp 32	Stelae d. 30	Dacarc 28.5	Hepatic leafy 29	Gravel 28	Salrot 27.5	Raclan 28.5
Salrot 34.5	Salrot 34.5	Thasp 34.5	Saxpun 30	Raclan 29.5	Stesp 27.5	Alenig 28.5	Thasp 28.5	Castet 27.5	Castet d. 30
Dicsp 34	Carsta d. 32 Litter 35	Salrot 33	Thasp 30.5	Castet 26	Salrot 29	Raclan 30	Castet 28	Carsta 28	**Tag** 30
Castet 32	Thasp 33.5	Cetcuc 32.5	Hylspl 30.5	Castet 28	Paphul 26	Paphul 11.5 Paphul 25.5	Castet d. 30	Castet d. 30.5	Castet d. 30

Barrow 1995
ITEX point-quadrat data
Plot: E 5 Date: August 12, 1995
North half of plot

C 18.9 **D 14.6**

Poaarc d. 19.5	Cetsp 17.5	Stesp 17	Carsta d. 14 Salrot 17	Salrot d. 16	Carsta d. 16	Litter 17	Carsta 12 Dacarc 17	Litter 17	Poaarc 15
Orgcru black 19	Raclan 19	Dicsp 19	Luzarc 17	Thasp 16	Salrot 17	**Tag** 17	Poaarc 16	Litter 15	Thasp 15
Carsta d. 18	Cetsp 18	**Tag** 19.5	Carsta d. 16.5	Bare ground 18.5	Dacarc 18	Stelae d. 18	Carsta d. 16.5	Orgcru white 15	Cetsp 15
Stelae 17.5	Alenig 18	Salrot d. 19	Bare ground 18	Bare ground 19	Salrot 19	Stone 18	Salrot 16	Cetsp 15.5	Salrot d. 14.5
Salrot 18	Salrot d. 16.5	Carsta 18	Alenig 17.5	Salrot 18	Salrot 18.5	Carsta d. 16	Carsta 14	Stelae d. 15	Cetsp 14

A 23.0 **B 18.9**

Barrow 1995
ITEX point-quadrat data
Plot: E 5 Date: August 12, 1995
South half of plot

Carsta d. 20	Carsta 17	Carsta 17	Carsta 16.5	Thasp 17.5	Salrot 17	Carsta 16.5	Carsta 16.5	Dacarc 16.5	Senatr 15
Litter 22.5	Salrot 19	Castet 17.5	Thasp 19.5	Aultur 19.5	Castet 18	Castet 18	Senatr 17	Castet 15.5	Litter 19
Litter 23.5	Saxpun 21	Salrot 21	Dicsp 21	Sphglo 20	Thasp 19.5	Dicsp 19	Salrot 18.5	Castet 17.5	Thasp 19
Dicsp 23	Sal 22	Dicsp 21	Salrot 21	Salrot 21	Sal 19	Senatr 18	Cetsp 19	Castet 19	Saxpun 20
Salrot 22	Dicsp 21	Dicsp 22.5	Dicsp 23	Dicsp 23	Salrot d. 21	Castet 18.5	Castet d. 20	Litter 21.5	Salrot 20

Barrow 1995
ITEX point-quadrat data
Plot: E 6 Date: August 13, 1995
North half of plot

C 15.1 **D 11.9**

Salrot 16	Dicsp 15.5	Cetisl 14	Salrot 15	Salrot 16.5	**Tag** 16	Cetisl 14.5	Aloalp 14	Arclat d. 10.5 Poaarc 12.5	Dacarc 13
Cetsp 16	**Tag** 15	Luzarc d. 15	Salrot 16	Dacarc 16	Salrot 15	Senatr 14	Arclat d. 13	Cetsp 14	Salrot 14
Cetsp 14.5	Aultur 16	Salrot 15	Salrot 15.5	Aloalp 15	Dicsp 13.5	Cetsp 14	Aloalp 14	Thasp 17	Salrot 16
Hylspl 15	Cetsp 14	Stelae d. 15	Salrot 15	Dacarc 15	Polalp 14	Litter 17	Salrot d. 17	Salrot 17	Salrot d. 16.5
Arclat 13.5	Dacarc 14	Castet 15	Salrot 15.5	Castet 15	Salrot 15	Castet 15.5	Cetcuc 16	Salrot 16.5	Saxcer 16.5

A 16.1 **B 15.9**

Barrow 1995
ITEX point-quadrat data
Plot: E 6 Date: August 13, 1995
South half of plot

Cetsp 15.5 ---	Raclan 16.5 ---	Stelae d. 15 ---	Castet 14 ---	Salrot 16 ---	Saxpun 15 ---	Arclat d. 12 --- Cetisl	Cetsp 17 ---	Salrot 18 ---	Salrot 17.5 ---
Arclat d. 15 ---	Castet 15 ---	Senatr 16 ---	Saxpun 14 ---	Castet 15 ---	Castet 16 ---	Arclat d. 12.5 --- Salrot 18	Arclat 8 --- Salrot 18.5	Arclat d. 16 ---	Dicsp 18.5 ---
Aloalp 12 --- Litter 16	Litter 14 ---	Arclat d. 15 ---	Castet 18 ---	Castet 16.5 ---	Pelsp? 17 ---	Arclat 15 ---	**Tag** 18.5 ---	Litter 18.5 ---	Salrot 17.5 ---
Salrot 16.5 ---	Salrot 16.5 ---	Castet 15.5 ---	Castet 16 ---	Litter 14.5 ---	Thasp 15.5 ---	Castet 16.5 ---	Aultur 18 ---	Arclat 16 ---	Salrot d. 17.5 ---
Aloalp 17 ---	Stone 17.5 ---	Poaarc d. 17.5 ---	Dacarc 17.5 ---	Castet 17.5 ---	Cetcuc 15.5 ---	Litter 18 ---	Arclat 14 --- Castet 17.5	Arclat 17.5 ---	Salrot 17 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 7 Date: August 13, 1995
North half of plot

C 16.4 **D 14.6**

Castet d. 17 ---	Salrot 16 ---	Cetsp 17 ---	Alenig 15.5 ---	Carsta d. 14 ---	Salrot 13 ---	Dicsp 15 ---	**Tag** 15.5 ---	Carsta d. 17 ---	Carsta 12 --- Litter 18
Aloalp 16 ---	Salrot 16 ---	Salrot 15 ---	**Tag** 14.5 ---	Salrot d. 14 ---	Sphglo 12.5 ---	Castet d. 13 ---	Alenig 14.5 ---	Cetsp 16.5 ---	Carsta 16 ---
Dicsp 18 ---	Dicsp 18 ---	Salrot 16.5 ---	Thasp 17 ---	Carsta d. 11 --- Pelsp? 14.5	Orgcru grey 13 ---	Poaarc 11.5 ---	Hypsp 15 ---	Castet 15.5 ---	Castet 17 ---
Carsta d. 16.5 ---	Castet 15 ---	Hylspl 18 ---	Salrot 15.5 ---	Carsta 12 --- Litter 16.5	Raclan 16 ---	Raclan 13.5 ---	Castet 14 ---	Castet 15.5 ---	Litter 14.5 ---
Castet 16 --- Tomnit 18.5	Arclat 11 --- Orgcru black 20.5	Stelae 16.5 ---	Castet 16 ---	Stelae d. 15.5 ---	Carsta 15 ---	Orgcru white 17.5 ---	Dacarc 16.5 ---	Alenig 16.5 ---	Bare ground 17 ---

A 18.8 **B 16.3**

Barrow 1995
ITEX point-quadrat data
Plot: E 7 Date: August 13, 1995
South half of plot

Stelae d. 18.5 ---	Luzarc 16 ---	Salrot 16.5 ---	Aultur 16.5 ---	Tomnit 19 ---	Stelae 18.5 ---	Castet 18 ---	Salrot 18 ---	Stone 18 ---	Bare ground 18 ---
Luzarc 18 ---	Luzarc 17 ---	Salrot 16.5 ---	--- ---	Castet 19 ---	Raclan 19 ---	Cetsp 20 ---	Thasp 19 ---	Orgcru grey 18 ---	Bare ground 19 ---
Salrot 19.5 ---	Salrot 20 ---	Saxpun 19 ---	Castet 18.5 ---	Tomnit 18.5 ---	Cetisl 18.5 ---	Cetisl 18.5 ---	Pelsp? 17.5 ---	Bare ground 18.5 ---	Stone 19 ---
Salrot 19 ---	**Tag** 21 ---	Aloalp 16 --- Orgcru grey 19.5	Castet 17 ---	Castet d. 16.5 ---	Aloalp d. 18.5 ---	Alenig 17.5 ---	Stelae 17 ---	**Tag** 19 ---	Aloalp 17 ---
Salrot 19.5 ---	Alenig 20.5 ---	Litter 18.5 ---	Bare ground 20 ---	Salrot 19 ---	Dacarc 19 ---	Litter 19 ---	Moss d. 20 ---	Salrot 19 ---	Salrot 18.5 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 8 Date: August 10, 1995
North half of plot

C 19.4 **D 9.9**

Salrot 17	Salrot 17	Salrot 14	Castet 14.5	Castet 14	Luzcon 14	Pothyp 14.5	**Tag** 14.5	Poaarc d. 13	Litter 13
Tag 17	Salrot 17	Pothyp 16	Litter 17	Pothyp 17	Thasp 17	Salrot 14	Luzcon 14	Litter 13	Salrot 13
Salrot 18	Pelsp? 18	Castet 17.5	Castet 19	Castet 16.5	Castet 15.5	Castet 14.5	Stesp 14.5	Litter 17	Hylspl 14
Salrot 19.5	Litter 20	Salrot d. 19	Litter 20.5	Castet 16.5	Luzcon d. 14.5 Salrot 16.5	Castet 16	Cetsp 15.5	Salrot 15.5	Castet d. 13.5
Salrot d. 21.5	Pothyp 20	Salrot 21	Salrot 20	Alenig 17	Castet 15.5	Stesp 18	Castet d. 15.5	Castet 14	Orgcru 15

A 21.2 **B 12.4**

Barrow 1995
ITEX point-quadrat data
Plot: E 8 Date: August, 1995
South half of plot

Salrot 22.5	Dicsp 19.5	Salrot 19.5	Alenig 16	Luzcon 15.5	Cetcuc 17	Castet 14 Litter 19.5	Castet d. 14.5	Litter 16	Castet d. 15.5
Salrot 22	Salrot 19.5	Alenig 20	Gravel 19.5	Bare ground 18	Castet 18	Castet d. 19	Cetsp 17.5	Pothyp 16	Castet 15
Gravel 23	Raclan d. 21.5	Salrot 18	Orgcru white 18.5	Bare ground 19.5	Castet 17	Castet d. 16.5	Thasp 16	Castet 14	Castet 14.5
Salrot 23	Raclan 21.5	Raclan 20	Tag 21	Luzarc d. 17	Salrot 18	Litter 18	Castet 14	Castet 14	Salrot 14.5
Salrot 22.5	Raclan 22	Raclan 20	Litter 21	Salrot 22	Litter 21.5	Litter 20	Tag 17	Luzcon 14.5	Salrot 14.5

Barrow 1995
ITEX point-quadrat data
Plot: E 9 Date: August 10, 1995
North half of plot

C 17.5 **D 12.6**

Salrot 18.5 ---	Dacarc 16 ---	Salrot 15.5 ---	**Tag** 16 ---	Poaarc 14 ---	Castet 14 ---	Castet 15.5 ---	Castet 16 ---	Caldon ---	Orgcru white 13.5 ---
Salrot 17.5 ---	Luzcon 14 ---	Alenig 14 ---	Salrot 15 ---	Litter 14 ---	Castet 13.5 ---	Luzcon d. 13.5 ---	Castet d. 14 ---	Alenig 13 ---	Castet 14 ---
Luzcon d. 16 ---	Alenig 15 ---	Alenig 14.5 ---	Raclan 15 ---	Luzcon d. 14.5 ---	Stelae d. 13 ---	Castet 13 ---	Castet 13.5 ---	Castet 13 ---	Poaarc 14 ---
Discap 18.5 ---	Litter 17 ---	Salrot 16.5 ---	Dacarc 16 ---	Cetisl 17 ---	Stelae d. 14 ---	Luzcon 14 ---	Luzcon d. 14 ---	Orgcru black 14 ---	**Tag** 13.5 ---
Arclat d. 17 ---	Luzcon d. 17 ---	Pothyp d. 16.5 ---	Luzcon 12 --- Salrot 16	Salrot 16 ---	Hylspl 15 ---	Stelae d. 13 ---	Luzcon 12 ---	Poaarc 13 ---	Salrot 13.5 ---

A 21.4 **B 14.3**

ITEX point-quadrat data
Plot: E 9 Date: August 10, 1995
South half of plot

Castet 16 ---	Castet 14.5 ---	Castet 13.5 --- Thasp 17.5	Salrot 16.5 ---	Pothyp 13.5 ---	Luzcon d. 14 ---	Luzcon d. 14 ---	Luzcon d. 12 ---	Stelae 12 ---	Raclan 14.5 ---
Litter 19.5 ---	Litter 19 ---	Castet 18 ---	Castet d. 17 ---	Salrot 15.5 ---	Salrot 14 ---	Litter 15 ---	Salrot 14 ---	Polalp 15 ---	Salrot 15 ---
Pothyp 19 ---	Castet d. 17.5 ---	Saxcer 19 ---	Castet 16 ---	Castet 14.5 ---	Salrot 15 ---	Litter 15.5 ---	**Tag** 15.5 ---	Litter 16 ---	Luzarc 16 ---
Castet d. 19.5 ---	Raclan d. 18.5 ---	Raclan d. 17 ---	Castet 13.5 ---	Castet 15.5 ---	Dramic 11 --- Litter 18	Salrot 15.5 ---	Litter 16.5 ---	Salrot 16.5 ---	Salrot 15 ---
Castet 22 ---	Litter 21 ---	Salrot 19 ---	Castet d. 15.5 ---	Cetcuc 17 ---	Salrot 18 ---	Litter 17.5 ---	Salrot 16 ---	Senatr 15.5 ---	Cetcuc 16 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 10 Date: July 14, 1995
North half of plot

C 20.7 **D 8.8**

Salrot d. 19.0 ---	Salrot 18.0 ---	Salrot 19.0 ---	Lichen 20.0 ---	Salrot d. 17.5 ---	Salrot d. 14.0 ---	Salrot d. 11.5 ---	Lichen 11.0 ---	Cetcuc 11.0 ---	Thasp 10.0 ---
Thasp 17.0 ---	Castet d. 19.0 ---	Salrot 18.5 ---	Litter 19.5 ---	Salrot 17.0 ---	Lichen 13.0 ---	Salrot 10.0 ---	Litter 10.0 ---	Cetsp 10.5 ---	**Tag** ---
Castet 19.5 ---	Castet d. 20.0 ---	Castet d. 19.0 ---	Alenig 15.5 ---	Salrot 15.0 ---	Alenig 12.5 ---	Castet 8.0 --- Alenig 12.5	Salrot 10.0 ---	Luzcon d. 10.5 --- Thasp 11.5	Salrot d. 10.0 ---
Tag ---	Castet d. 18.5 ---	Castet d. 17.0 ---	Castet 13.0 ---	Castet 10.0 --- Salrot 11.5	Castet 10.0 --- Castet 13.5	Castet 10.0 ---	Castet 9.0 ---	Alenig 9.5 ---	Salrot 10.0 ---
Castet d. 18.5 ---	Cetcuc 17.5 ---	Alenig 15.5 ---	Castet 12.0 ---	Castet d. 12.5 ---	Castet 11.0 ---	Aultur 10.0 ---	Castet 8.5 ---	Stesp 10.0 ---	Orgcru black 9.5 ---

A 16.1 **B 6.4**

Barrow 1995
ITEX point-quadrat data
Plot: E 10 Date: July 14, 1995
South half of plot

Alenig 18.5 --- 	Castet 13.5 --- Castet 17.0	Dacarc 16.0 ---	Castet d. 13.0 ---	Salrot 12.5 ---	Castet 10.5 ---	Castet 7.5 --- Litter 11.5	Bare ground --- 	Bare ground --- 	Stone ---
Dacarc 17.5 --- 	Thasp 14.5 --- 	Alenig 13.5 --- Thasp 14.0	Castet d. 13.5 ---	Castet 11.5 ---	Salrot 10.5 ---	Salrot 9.0 --- 	Stone --- 	Stone --- 	Stone ---
Castet d. 18.5 --- 	Castet 13.5 --- 	Salrot 13.0 --- Litter 14.5	Salrot 12.0 --- Litter 13.0	Castet 11.5 --- Thasp 12.5	Salrot 10.0 ---	Tag --- 	Stone --- 	Tag --- 	Stone ---
Pothyp 12.0 --- Pothyp d. 15.0	Castet 14.0 --- 	Stesp 13.5 --- 	Castet 11.0 --- 	Stelae 10.5 --- 	Salrot 11.0 --- 	Pothyp 9.5 --- Castet 10.5	Salrot 7.5 --- 	Orgcru white 8.0 --- 	Stone ---
Dacarc 16.5 --- 	Orgcru white 14.0 --- 	Orgcru white 13.5 --- 	Castet d. 12.5 --- 	Stelae 9.5 --- Thasp 13.0	Dacarc 12.0 --- Castet 12.5	Castet d. 11.0 --- 	Pothyp 8.0 --- Salrot 9.0	Salrot 8.5 --- 	Stone ---

Barrow 1995
ITEX point-quadrat data
Plot: E 11 Date: July 11, 1995
North half of plot

C 14.2 **D 10.1**

Litter 15.5	Stelae d. 15.0	Stelae d. 14.5 Alenig 16.0	Salrot 16.5	Poaarc d. 17.0	Alenig 17.0	Litter 17.0	Litter 15.5	Salrot 11.5	Luzcon 9 Salrot d. 12
Dacarc 16.5	**Tag**	Pelsp? 14.5	Castet d. 15.5	Thasp 16.0	Castet 14.0	**Tag**	Pothyp 13.0 Moss 14.5	Orgcru white 12.5	Alenig 12
Castet 13.5	Sphglo 13.0	Litter 15.0	Castet 15.0 Orgcru white 16.0	Alenig 16.0	Litter 15.5	Castet 14.5	Luzcon d. 14.0	Cetisl 13.5	Salrot 13
Dacarc 11.0	Stelae d. 13.5	Orgcru white 15.0	Orgcru white 15.5	Alenig 15.0	Castet 14.5	Castet 12.5	Castet 12.0 Cetcuc 14.0	Luzcon d. 11.5	Cetcuc 12
Salrot 11.0	Litter 10.5	Stelae d. 11.5	Castet 14.5	Salrot 13.0	Alenig 13.5	Poaarc d. 15.0	Cetcuc 14.5	Castet d. 12.0	Cetcuc 13.0

A 9.8 **B 10.3**

Barrow 1995
ITEX point-quadrat data
Plot: E 11 Date: July 11, 1995
South half of plot

Stelae d. 9.0 --- Orgcru black 10.0	Salrot d. 9.5 ---	Castet 9.5 --- Castet d. 11.0	Castet d. 10.0 ---	Luzcon 10.5 ---	Luzarc d. 14.0 ---	Cetsp brown 17.5 ---	Dacarc 17.5 ---	Litter 16.5 ---	Stelae d. 15.0 --- Castet d. 16.5
Moss? d. 9.0 ---	Stelae. d. 6.5 --- Litter 8.5	Arclat 9.0 ---	Salrot 9.0 ---	Castet 11.5 ---	Moss? 14.5 ---	Dacarc 18.0 ---	Cetsp ---	Castet d. 15.5 ---	Castet d. 15.5 ---
Sphglo 9.0 ---	Orgcru white 10.5 ---	Castet d. 10.5 ---	Castet 10.5 ---	Dacarc 13.0 ---	Castet 16.0 ---	Luzcon d. 14.5 --- Alenig 17.0	Luzcon 13.5 --- Cetcuc 15.5	Luzcon d. 12.0 --- Alenig 12.5	Litter 11.0 ---
Castet 7.6 --- Litter 8.5	Pothyp 9.0 --- Litter 9.5	Castet d. 8.0 --- Litter 10.0	Salrot d. 11.5 --- Salrot d. 12.0	Alenig 15.5 ---	**Tag** ---	Litter 16.0 ---	Orgcru white 15.5 ---	Salrot 12.5 ---	Salrot 10.5 ---
Castet 7.5 --- Litter 13.0	Luzcon 7.0 --- Alenig 10.0	Salrot d. 11.1 --- Bare ground 12.0	Salrot 13.5 --- Stelae 14.0	Alenig 15.5 ---	Poaarc d. 11.5 --- Thasp 14.0	Stelae d. 15.5 --- Litter 16.5	Luzcon d. 13.0 --- Alenig 15.0	Cetisl 11.0 --- Hepatic leafy 12.5	Stelae. d. 9.5 --- Salrot d. 10.5

Barrow 1995
ITEX point-quadrat data
Plot: E 12 Date: July 16, 1995
North half of plot

C 21.8 **D 9.4**

Castet 20	Castet 18	Alenig 17	Luzcon 16 Castet 17	Castet d. 17	Luzcon d. 16.5 Castet d. 17.5	Alenig 15.5	Thasp 17.5	Castet 16	Luzcon d. 10.5
Alenig 18.5	Cetcuc 19	Thasp 19	Castet d. 18	Thasp 17	Caribou drop 13	Alenig 14.5	Castet 15	Castet 14	Castet d. 10
Alenig 17.5	**Tag** 19.5	Salrot 17	Alenig 17.5	Luzcon 14.5 Alenig 17.5	Castet d. 14.5	Cetcuc 15.5	Thasp 15.5	Salrot d. 14	Alenig 10
Thasp 16	Luzcon d. 15.5	Luzcon 17.5	Alenig 18	Alenig 17.5	Luzcon d. 15.5 Alenig 17	Cetisl 16	Salrot 16.5 Lichen 17	Castet 12.5	Salrot d. 11
Thasp 17	Castet 14.5 Thasp 16.5	Castet 13 Castet d. 16.5	Alenig 16.5	Cetcuc 17.5	Litter 19.5	Alenig 16	Alenig 13.5 -Thasp 14.5	Castet 14.5	Castet d. 7.5

A 18.9 **D 14.6**

Barrow 1995
ITEX point-quadrat data
Plot: E 12 Date: July 14, 1995
South half of plot

Cetcuc 18.0 ---	Castet 16.0 ---	Alenig 14.5 ---	Bare ground 15.5 ---	Castet 13.5 ---	Castet d. 17.0 ---	Castet 15.5 ---	Thasp 13.5 --- Alenig 15	Castet 12.5 ---	Stelae d. 9.0 --- Castet d. 11.5
Castet d. 17.0 ---	Castet 16.0 --- Cetsp 17.0	Castet d. 16.0 ---	Stone 16.5 ---	Bare ground 15.0 ---	Cetisl 15.0 ---	Castet 15.0 --- Castet d. 18.5	Alenig 15.5 ---	Castet 7.0 --- Alenig 13.0	Castet 9.5 ---
Arclat d. 16.0 --- Litter 18.0	Castet 16.5 ---	Raclan 17.0 ---	Bare ground 18.0 ---	Thasp 17.0 ---	Bare ground 17.0 ---	Bare ground 17.5 ---	Castet 13.5 --- Salrot d. 14.5	Castet d. 14.5 ---	Castet 11.0 --- Castet 14.0
Salrot 18.5 ---	Bare ground 16.5 ---	**Tag** ---	Litter 17.0 ---	Orgcru black ---	Raclan 15.0 ---	**Tag** --- -	Bare ground 15.0 ---	Castet d. 17.0 ---	Castet 10.5 --- Alenig 15.0
Luzarc 20.0 --- Salrot 21.0	Litter 20.5 ---	Alenig 15.5 ---	Cetcuc 16.0 ---	Thasp 16.5 ---	Salrot 15.5 ---	Cetisl 25.2 --- -	Castet d. 17.5 ---	Thasp 15.5 ---	Alenig 15.0 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 13 Date: July 21, 1995
North half of plot

C 13.3 **D 9.0**

Castet 17 ---	Litter 17 ---	Litter 15 ---	Bare ground 12 ---	Pedkan 13 ---	Alenig 12 ---	Castet 11 ---	Alenig 10 ---	Raclan 10.5 ---	Castet 9 ---
Alenig 16.5 ---	Cetcuc 16.5 ---	Castet d. 14 ---	Castet 12 ---	**Tag** 12 ---	Castet d. 11.5 ---	Salrot d. 12.5 ---	**Tag** 11 ---	Pothyp 9.5 ---	Alenig 11 ---
Litter 16 ---	Cetcuc 14 ---	Pedkan d. 4.5 --- Castet d. 14	Rhyrug 12 ---	Castet d. 12 ---	Castet 12 ---	Raclan 11 ---	Castet d. 11 ---	Thasp 12.5 ---	Dacarc 16 ---
Stelae d. 15 ---	Dacarc 13 ---	Pedkan 11.5 ---	Cetcuc 12.5 ---	Castet 13 ---	Castet 12.5 ---	Poaarc 11 --- Alenig 11	Cetcuc 12.5 ---	Cetcuc 17.5 ---	Thasp 17.5 ---
Thasp 11 ---	Castet d. 11 ---	Salrot 10 ---	Litter 11.5 ---	Castet d. 12 ---	Castet 8 ---	Poaarc 8 ---	Orgcru white 9 ---	Polalp 11.5 ---	Dipsp ---

A 11.7 **B 10.4**

Barrow 1995
ITEX point-quadrat data
Plot: E 13 Date: July 21, 1995
South half of plot

Orgcru black 11 ---	Luzcon d. 8 ---	Stelae d. 8 ---	Cetsp 11 ---	Castet 10.5 ---	Castet 8.5 ---	Pelsp 7.5 ---	Orgcru white 7.5 ---	Contet 9 ---	Orgcru white 9.5 ---
Salrot 12 ---	Luzcon d. 11 ---	Alenig 10 ---	Dacarc 11 ---	Dacarc 11 ---	Salrot 7 ---	Wire **Tag** 6 ---	Orgcru white 7 ---	Gymcor 7.5 ---	Timaus 9 ---
Dacarc 11 ---	Salrot 11 ---	Pothyp 12.5 --- Litter 13	Alenig 9.5 ---	Cetsp 8 ---	Brasp. 7.5 ---	Lichen 6.5 ---	Pelsp? 6.5 ---	Pelsp? 6 ---	Orgcru grey 8 ---
Salrot d. 11.5 ---	Litter 10 ---	Lichen 8.5 ---	Salrot 7 ---	Salrot d. 6 ---	Salrot 6 ---	Orgcru black 6.5 ---	Orgcru white 8 ---	Alenig 8 ---	Contet 8 ---
Litter 13 ---	Salrot 11.5 ---	Salrot 10 ---	**Tag** 6 ---	Alenig 7 ---	Salrot d. 6 ---	Bare ground 7.5 ---	Caribou shet 7 ---	Orgcru white 7.5 ---	Orgcru white 9.5 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 14 Date: July 14, 1995
North half of plot

C 9.5 **D 14.4**

Alenig 15	Litter 15.5	Castet d. 13	Pothyp 7 Pothyp 10.5	Castet 8.5	Castet d. 8.5	Salrot 8	Salrot 9.5	Litter 9.5	Salrot 10
Litter 17	**Tag** 17	Litter 16.5	Castet 14.5	Cetisl 13	Litter 13	Litter 10.5	Alenig 10	Pedkan d. 12	Pedkan 10.5 Dacarc 12.5
Litter 14	Litter 14.5	Orgcru white 14.5	Alenig 13.5	Hylspl 13	Castet d. 11	Castet 9.5 Castet d. 12	Litter 13.5	**Tag** 15	Stesp 14
Castet 11	Castet d. 11	Thasp 13	Litter 15	Litter 14	Cetcuc 12	Castet d. 12	Dacarc 12.5	Castet d. 12.5	Polalp 12
Castet 9 Salrot d. 11.5	Orgcru black 12	Litter 13.5	Poaarc d. 11.5	Castet 9 Luzarc 12.5	Litter 14	Castet d. 12	Castet d. 11	Castet 9.5	Salrot d. 10

A 15.4 **B 11.1**

Barrow 1995
ITEX point-quadrat data
Plot: E 14 Date: July 14, 1995
South half of plot

Luzarc d. 13	Litter 13.5	Salrot 12	Salrot d. 10.5	Orgcru white 10	Castet 10	Dacarc 9.5	Pothyp 8	Castet 10.5	Thasp 12.5
							Litter 10.5	Orgcru black 11	
Castet 13.5	Salrot 13	Salrot 11	Poaarc d. 9.5	Pohsp 11.5	Salrot 10	Orgcru grey 11	Salrot d. 10	Stone 11.5	Bare ground 11
Alenig 15			Orgcru white 10				Orgcru black 10.5		
Alenig 16	Salrot 12.5	Salrot d. 9.5	Castet d. 9	**Tag** 11	Raclan 11	Salrot 10.5	Stone 11	**Tag** 11	Stone 12
Castet d. 16	Castet 13.5	Castet 12.5	Salrot 10.5	Stone 12	Bare ground 13	Castet 10.5	Castet d. 10.5	Castet d. 10	Castet d. 12
	Cetsp 15		Thasp 12			Stone 13	Luzcon d. 13		
Castet 12	Alenig 13.5	Castet 12.5	Castet 13	Raclan 12	Castet 11	Castet 10	Litter 12	Luzcon 10	Tham 12.5
	Cetsp 14.5		Raclan 13.5			Thasp 12		Dacarc 12.5	Raclan 14

Barrow 1995
ITEX point-quadrat data
Plot: E 15 Date: July 12, 1995
North half of plot

C 14.2 **D 21.2**

Stelae d. 14	Salrot d. 14.5	Castet 15	Stelae d. 17 Castet d. 18.5	Castet 20	Pothyp 22 Hylspl 23	Pticil 23	Litter 27	?? 	Litter 20.5
Alenig 17	Thasp 17	Castet 16 Dacarc 18.5	Dacarc 18	Dacarc 19	Alesp 22	Litter 23	Alenig 24	Salrot 21	Pothyp d. 12 Pothyp d. 17
Orgcru white 19	Castet 16.5	Thasp 17	Cetisl 16.5	Castet 17.5	Litter 21	Alenig 20.5	Salrot 20	Cetsp 19.5	Castet 16
Cetsp 16	Castet d. 18	Cetcuc 18	Castet d. 20	Castet 18	Alenig 19.5	Litter 20.5	Stelae 18.5	Castet 15.5 Castet d. 17.5	Salrot 16 Thasp 16.5
Alenig 15	Salrot 13	Salrot 13.5	Alenig 15	Thasp 18	Salrot 17	Salrot 21	Litter 22	Senatr 22	Thasp 19

A 17.9 **B 16.4**

Barrow 1995
ITEX point-quadrat data
Plot: E 15 Date: July 12, 1995
South half of plot

Castet 16 ---	Salrot 13.5 ---	Castet d. 14 ---	Thasp 18 ---	Castet d. 19 ---	Dacarc 17.5 ---	Castet d. 16.5 ---	Stelae 16.5 --- Litter 20.5	Litter 21.5 ---	Cetsp 20 ---
Cetsp 14 ---	Salrot 13.5 ---	Stelae d. 14.5 --- Litter 15.5	Castet 16 ---	Salrot d. 16.5 --- Castet d. 17	Castet d. 19.5 ---	Dacarc 23.5 ---	Stelae d. 20 --- Cetcuc 22.5	Stelae d. 13 --- Stelae d. 22	Salrot 17 ---
Luzcon d. 14 --- Cetisl 15	Salrot 13.5 ---	Salrot 14.5 ---	Castet d. 16.5 ---	Saxcer 16.5 --- Castet 17	Castet d. 21 --- Dacarc 25	Dicsp 23 ---	Stelae d. 18 --- Dacarc 20	Luzcon d. 18 --- Litter 19	Dacarc 17 ---
Salrot 15.5 ---	Salrot 18.5 ---	Salrot 18 ---	Castet d. 15 --- Castet 16.5	Luzcon 14.5 ---	Castet 17 --- Castet d. 20	Luzcon d. 20 --- Orgcru 20.5	Thasp 19.5 ---	Litter 18 ---	Salrot 15 ---
Salrot 19 ---	Cetcuc 18 --- Thasp 19	Salrot 20.5 ---	Luzcon d. 15 --- Salrot 19	Luzcon d. 16 --- Salrot 20	Luzcon d. 16 --- Castet 18.5	Cetcuc 19.5 ---	Salrot 20.5 ---	Litter 20 ---	Salrot 21 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 16 Date: July 1, 1995
North half of plot

C 21.4 **D 10.3**

Arclat 16 --- Litter 23.5	Salrot 14.5 ---	Thasp 14 ---	Arclat 14 --- Thasp 15.5	Thasp 17 ---	Luzcon 8.5 --- Litter 15	Salrot d. 15 ---	Salrot 14.5 ---	Salrot 12.5 ---	Salrot 12 ---
Arclat d. 14 --- Timaus 16.5	Salrot 12 ---	Saxpun 12.5 ---	Alenig 14.5 ---	Salrot 13.5 ---	Arclat 11 ---	Arclat d. 11.5 --- Litter 12	Arclat d. 12.5 --- Litter 14	Timaus 14.5 ---	Arclat d. 10 --- Alenig 13.5
Tag ---	Frame ---	Arclat d. 11.5 --- Hepatic leafy 12	Arclat 9 --- Salrot 12.5	Arclat d. 11.5 ---	Poaarc 9.5 --- Hepatic leafy 10	Pothyp 9 --- Timaus 11	Litter 11.5 ---	Salrot 11 ---	Arclat 10 --- Timaus 11.5
Pothyp 11 --- Pothyp d. 13.5	Castet 12 ---	Salrot d. 11 ---	Salrot 12 ---	Orgcru grey 11 ---	Cetisl 10 ---	Oncwah 10 ---	Stelae d. 10 --- Litter 11	Litter 11 ---	Arclat d. 7 --- Lichen 10
Castet d. 14 ---	Castet 11 ---	Arclat 10 --- Salrot 11	Arclat d. 10 --- Castet d. 13.5	Alenig 11.5 ---	Luzcon d. 11 ---	Arclat 6.5 --- Litter 11	Litter 11.5 ---	Litter 10 ---	Litter 9.5 ---

A 14.4 **B 14.5**

Barrow 1995
ITEX point-quadrat data
Plot: E 16 Date: July 13, 1995
South half of plot

Castet 15 ---	Castet 13 ---	Lichen 13 ---	Castet 8.5 --- Hylspl 11	Castet d. 21 ---	Litter 13 ---	Arclat d. 10.5 --- Stereo 12.5	Arclat 10.5 --- Stereo 12	Alenig 12.5 ---	Dicsp 11 ---
Arclat d. 17 --- Dacarc 21.5	Castet 12.5 --- Castet 16	Castet 11.5 --- Castet d. 14	Castet 10.5 --- Thasp 14	Dacarc 12 --- Castet d. 14.5	Cetisl 12 ---	Orgcru black 12 ---	Arclat d. 13 --- Dacarc 16.5	Litter 15 ---	Litter 13.5 ---
Salrot 23 --- Ochfri? 23.5	Castet 16 --- Castet 21	Castet 13.5 --- Castet d. 19	Castet 14.5 --- Dacarc 17.5	Litter 17 ---	**Tag** ? ---	Orgcru white 17 ---	Dacarc 16 ---	Salrot 13.5 ---	Salrot 14.5 ---
Pothyp d. 18.5 ---	Castet d. 20.5 ---	Dacarc 21.5 ---	Luzcon d. 16.5 --- Thasp 18	Castet d. 16 --- Pelsp 16.5	Cetcuc 16 ---	**Tag** ? ---	Salrot 15.5 ---	Dicsp 17.5 ---	Luzcon d. 15 --- Barith 19.5
Salrot 16 --- Thasp 17.5	Salrot 17 ---	Castet d. 21.5 ---	Castet 20 ---	Salrot 17 ---	Castet 15 ---	Salrot 15.5 ---	Arclat 12 --- Salrot 16	Litter 17.5 ---	Alenig 17 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 17 Date: July 16, 1995
North half of plot

C 13.6 **D 8.6**

Dicsp 13.5	**Tag** 14	Alenig 13	Cetcuc 12.5	Dacarc 13	Castet 12	Stelae d. 12.5	**Tag** 13.5	Oncwah 11	Luzcon d. 9.5
Salrot 14	Litter 14.5	Cetisl 13	Orgcru white 14	Dramic 9.5 Castet 11.5	Castet 12	Castet d. 11.5	Dacarc 11	Thasp 13	Thasp 12.5
Salrot 14.5	Aultur 14.5	Cetcuc 15	Pothyp 12.5	Castet d. 10.5	Cetcuc 11	Castet d. 11	Thasp 10.5	Alenig 12	Dicsp ?
Castet 12 Stelae 13	Castet d. 14	Dacarc 17.5	Castet 14.5	Salrot 13	Thasp 13	Thasp 13	Castet 12.5	Pohsp 12.5	Arclat d. 12.5
Litter 13	Tomnit 15	Castet 12.5 Pothyp 15	Castet 10 Castet d. 15.5	Sanunc 14	Alenig 12	Salrot 12	Salrot 13	Thasp 12.5	Tomnit 14

A 10.5 **B 6.7**

Barrow 1995
ITEX point-quadrat data
Plot: E 17 Date: July 16, 1995
South half of plot

Castet 12 ---	Dicsp 15 ---	Castet 14 --- Tomnit 15.5	Tomnit 13 ---	Castet d. 11 ---	Salrot 11 ---	Salrot d. 11.5 ---	Thasp 12 ---	Litter 13 ---	Salrot d. 16.5 ---
Litter 15.5 ---	Castet d. 16 ---	Thasp 14 ---	Dacarc 12.5 ---	Litter 11.5 ---	Tomnit 12.5 ---	Salrot d. 11 ---	Thasp 12 ---	Stelae 9 --- Litter 11	Pelsp 10.5 ---
Salrot 14 ---	Castet d. 12.5 --- Hylspl 14	**Tag** 12 ---	Salrot 12.5 ---	Stelae d. 10 --- Litter 10.5	Castet d. 9 ---	Orgcru grey 9.5 ---	Orgcru grey 10 ---	Tomnit 10 ---	Salrot d. 10.5 ---
Litter 11 ---	Castet d. 12 ---	Orgcru white 12 ---	Papsp 10.5 ---	Litter 11 ---	Salrot d. 10 --- Litter 10.5	**Tag** 9 ---	Orgcru white 10 ---	Salrot 9 --- Orgcru black 9.5	Lichen 9 ---
Hylspl 12 ---	Salrot 12.5 ---	Cetisl 9 ---	Litter 11 ---	Orgcru black 11 ---	Thasp 9 ---	Thasp 10 ---	Castet 6 --- Orgcru grey 8.5	Salrot d. 8.5 ---	Hepatic leafy ? ---

Barrow 1995
ITEX point-quadrat data
Plot: E 18 Date: July 16, 1995
North half of plot

C 9.5 **D 11.8**

Castet d. 10	Castet d. 9.5	Castet 9	Castet d. 9.5	Castet d. 9	Castet 8	**Tag** 11.5	Salrot d. 11.5	Salrot d. 11.5	Stereo 13.5
Luzcon d. 9.5	Litter 13	Castet 11	Luzcon d. 10	Cetcuc 10	Luzcon d. 10 Dicnel 11	Castet d. 10	Luzcon d. 10.5	Litter 11.5	Castet 13 Litter 15
Salrot d. 12	Lichen 11.5	Stelae 11 Raclan 12	Cetisl 11	Pothyp 10.5	Salrot d. 11	Litter 12	Salrot d. 13	Litter 14	Orgcru white 13
Litter 15	Salrot 14	Salrot 13.5	Salrot 12.5	Litter 15	Salrot 15	Salrot 13	Castet 12.5	Salrot 13	Litter 9
Salrot 15	Luzcon 12 Salrot 15	Thasp 16	Salrot 16	Moss? 17	Litter 14.5	Salrot 11	Cetcuc 12	Salrot 9.5	Orgcru black 7.5

A 12.4 **B 12.9**

Barrow 1995
ITEX point-quadrat data
Plot: E 18 Date: July 16, 1995
South half of plot

Salrot d. 16	Salrot 15.5	Salrot 17.5	Dicsp d. 15.5	Salrot 12.5	Arclat 7 / Arclat 10.5	Salrot 9	Salrot d. 9.5	Luzcon d. 5 / Salrot 6	Salrot d. 4.5
Tag 19	Alenig 18	Litter 19	Salrot d. 10.5	Cetsp 10	Luzcon d. 8.5	Salrot d. 9	Salrot 7.5	Salrot d. 6	Salrot 5.5
Cetcuc 18	Moss? 17	Salrot d. 16	Litter 10	Castet d. 9	Castet d. 8	Stelae 7	Stelae d. 5 / Salrot 8	Stelae 5 / Litter 7.5	Aultur 8
Luzcon d. 12 / Litter 15.5	Salrot d. 14	Salrot 11.5	Cetcuc 8.5	Salrot 8	Castet 7	Castet 5 / Castet 9	Alenig 6.5	Litter 7	Salrot 8.5
Stelae 11 / Bare ground 13	Salrot 11	Luzcon 12.5	Salrot 8.5	Salrot 8	Cetcuc 8.5	**Tag** 8	Orgcru grey 7.5	Orgcru black 8	Salrot 8.5

Barrow 1995
ITEX point-quadrat data
Plot: E 19 Date: July 20, 1995
North half of plot

C 10.4 **D 9.6**

Orgcru white 12.0	**Tag** 12.0	Litter 12.5	Orgcru white 13.0	Salrot 13.0	Poaarc 11.5	Stelae d. 10.0	Thasp 11.5	Castet d. 10.0	Alenig 9.0
Stelae 13.0	Thasp 11.0	Alenig 11.0	Orgcru white 12.0	Litter 14.0	Orgcru grey 11.0	Salrot 10.5	Alenig 11.5	Pothyp 11.5	Litter 9.0
Cetcuc 11.5	Castet d. 12.0	Alenig 11.0	Raclan 12.0	Stelae 11.0	Stelae d. 10.0	Salrot 9.0	Alenig 9.5	Pothyp 6.0 --- Pothyp d. 11.0	Litter 7.5
Castet d. 13.0	Castet d. 13.0	Litter 12.0	Castet 10.5	Castet d. 11.0	Salrot 9.0	Litter 10.0	Salrot d. 10.5	Thasp 12.0	Castet 9.5
Alenig 14.5	Castet d. 13.0	Salrot d. 13.0	Stelae d. 10.5	Castet d. 9.5	Alenig 10.5	Orgcru white 11.5	Alenig 12.0	Castet d. 12.0	Castet 6.5 --- Castet d. 11.0

A 10.1 **B 6.3**

Barrow 1995
ITEX point-quadrat data
Plot: E 19 Date: July 20, 1995
South half of plot

Dacarc 13.0 ---	Luzcon d. 13.0 --- Castet d. 16.5	Stelae 9.5 --- Litter 11.0	Salrot 8.0 ---	Castet d. 8.0 ---	Pol?alp 10.0 ---	Litter 12.0 ---	Castet d. 11.0 ---	Castet d. 8.5 ---	Hepatic 7.0 ---
Luzcon 14.5 ---	Litter 15.5 ---	Castet 13.0 ---	Litter 13.0 ---	Luzcon d. 9.0 --- Castet d. 12.5	Pothyp 12.5 --- Litter 15.5	Castet 11.5 ---	Castet 10.0 ---	Salrot d. 7.0 ---	**Tag** 6.0 ---
Castet d. 13.0 ---	Castet 11.0 ---	Pothyp d. 13.0 ---	Moss? 15.0 ---	Thasp 13.5 ---	Castet 12.5 ---	Thasp 11.0 ---	Castet 7.5 --- Thasp 9.0	Salrot 6.5 ---	Litter 7.0 ---
Castet 9.5 --- Litter 13.0	Litter 13.5 ---	Castet d. 14.0 ---	Castet d. 14.0 ---	Polalp? 12.0 ---	Dicsp. 9.0 ---	Litter 9.5 ---	Castet 7.0 ---	Alenig 8.0 ---	Salrot 6.5 ---
Salrot 11.0 ---	Castet d. 10.0 ---	Pothyp 12.5 --- Litter 14.0	Cetsp brown 13.0 ---	Castet d. 10.5 ---	Castet 12.0 ---	Castet 11.0 ---	Castet 4.0 --- Castet 8.0	Castet 7.0 ---	Dacarc 6.0 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 20 Date: July 20, 1995
North half of plot

C 11.1 **D 8.6**

Cetcuc 14	Cetcuc 12	Litter 11.5	Litter 11	Thasp 12	Alenig 12	Salrot d. 11.5	Salrot 11.5	Castet d. 9	Litter 9
Litter 13	Alenig 12	Poaarc 10 Alenig 10.5	Salrot d. 10.5	**Tag** 11	Litter 10.5	Raclan 11	Dicsp d. 9.5	Cetcuc 9	Alenig 8.5
Salrot 11.5	Sphglo 12.5	Orgcru white 11	Alenig 11	Dacarc 11	Alenig 10	Salrot 10	Raclan 9	Stelae d. 9.5	Litter 10
Stone 12.5	Castet d. 11	Castet d. 10.5	Thasp 10	Dacarc 10	Salrot 10.5	Litter 9.5	Litter 9	Litter 8	Alenig 8
Castet 12	Castet d. 13	Thasp 12.5	Alenig 11	Castet 10	Alenig 10	Orgcru white 10	Salrot 9	Castet d. 8	Litter 10

A 14.3 **B 8.1**

Barrow 1995
ITEX point-quadrat data
Plot: E 20 Date: July 20, 1995
South half of plot

Castet 12.5	Alenig 13	Thasp 12	Thasp 11	Alenig 9.5	Alenig 9.5	Alenig 9	Alenig 8	Castet d. 7.5	Castet 9
Luzcon d. 12.5 Litter 13.5	Castet 11.5	Cetsp 11.5	Litter 12	Alenig 9	Dacarc 9	Alenig 9.5	Litter 8.5	Alenig 8.5	Alenig 8
Castet 13	Castet d. 11.5	Dacarc 10.5	Cetcuc 12	Castet d. 10	Alenig 10	Alenig 10.5	Alenig 9.5	Salrot 8.5	Alenig 8
Castet 12.5	Castet d. 12.5	Luzcon 13 Thasp 14.5	Lichen 13.5	Litter 13.5	Salrot d. 11.5	Salrot 9	Cetcuc 8.5	Salrot 9.5	Salrot d. 10
Alenig 13.5 Thasp 14	Pohsp 14	Alenig 14	**Tag** 14.5	Litter 13	Luzcon d. 10.5 Litter 12	Lichen 9	**Tag** 9.5	Alenig 10.5	Thasp 9

Barrow 1995
ITEX point-quadrat data
Plot: E 21 Date: July 21, 1995
North half of plot

C 13.5 **D 9.7**

Litter 16.0 ---	Salrot 16.0 ---	Salrot 15.0 ---	Orgcru white 15.0 ---	Salrot 13.0 ---	Salrot d. 12.0 ---	Litter 11.5 ---	Salrot 11.0 ---	Orgcru white 10.0 ---	Lichen 10.5 ---
Litter 17.0 ---	Cetcuc 18.0 ---	Salrot 16.0 ---	Salrot 14.5 ---	Salrot d. 12.0 ---	Salrot 11.0 ---	Tag 11.5 ---	Litter 11.5 ---	Lichen 11.0 ---	Polalp? 13.0 ---
Salrot d. 18.0 ---	Salrot 19.0 ---	Cetsp brown 17.0 ---	Salrot 16.0 ---	Litter 13.0 ---	Alenig 12.0 ---	Salrot d. 13.5 ---	Sphglo 13.0 ---	Dacarc 13.0 ---	Dicsp. 14.0 ---
Litter 18.0 ---	Saxpun 15.0 --- Litter 18.5	Saxpun 18.0 ---	Alenig 17.0 ---	Pothyp 12.5 --- Pothyp 15.0	Salrot 15.5 ---	Cetcuc 16.5 ---	Dacarc 15.0 ---	Salrot 14.5 ---	Lichen 12.5 ---
Litter 13.5 ---	Litter 19.0 ---	Cetcuc 19.0 ---	Litter 19.0 ---	Litter 19.0 ---	Stelae d. 16.0 ---	Castet d. 15.0 ---	Castet 13.0 ---	Salrot d. 7.5 ---	Luzcon d. 7.0 ---

A 14.1 **B 12.2**

Barrow 1995
ITEX point-quadrat data
Plot: E 21 Date: July 21, 1995
South half of plot

Orgcru grey 17.0 ---	Cetsp brown 16.5 ---	Salrot 17.0 ---	Castet d. 17.0 ---	Saxpun 16.0 ---	Castet 13.0 ---	Castet 11.0 ---	Salrot 9.0 ---	Luzcon 4.0 --- Lichen 7.5	Luzcon d. 5.5 --- Dacarc 6.5
Salrot 16.0 ---	Orgcru grey 15.0 ---	Salrot 14.0 ---	Castet d. 13.0 ---	Castet d. 14.5 ---	Castet 12.5 ---	Castet d. 11.0 ---	Saxpun 9.0 ---	Litter 8.0 ---	Alenig 6.5 ---
Alenig 16.0 ---	Cetcuc 13.0 ---	Salrot 12.5 ---	Salrot 11.5 ---	Castet d. 13.0 ---	Castet 12.5 ---	Salrot 10.0 ---	Litter 11.5 ---	Saxpun 9.0 ---	Lichen 9.0 ---
Tag 15.0 ---	Alenig 14.0 ---	Salrot 12.0 ---	Salrot 11.5 ---	Castet 8.5 --- Castet d. 13.5	Castet 13.0 ---	Castet 11.5 ---	Litter 13.5 ---	Moss? 11.0 ---	Litter 9.5 ---
Bare ground 16.0 ---	Salrot 13.0 ---	Salrot 14.0 ---	Salrot 12.0 ---	Salrot 11.5 ---	Castet 9.0 --- Castet 14.0	Castet 12.0 ---	Salrot 13.0 ---	**Tag** 13.5 ---	Litter 12.5 ---

Barrow 1995
ITEX point-quadrat data
Plot: E 22 Date: July 17, 1995
North half of plot

C 12.7 **D 11.0**

Castet d. 14.5 ---	Dacarc 14.5 ---	**Tag** 14.0 ---	Salrot 14.0 ---	Salrot 13.0 ---	Alenig 12.0 ---	Litter 11.5 ---	**Tag** 11.0 ---	Luzcon 10.0 --- Salrot d. 13.0	Litter 12.0 ---
Thasp 21.5 ---	Caribou scat 17.5 ---	Castet 14.0 ---	Pohlia sp. 14.0 ---	Orgcru white 13.5 ---	Litter 13.0 ---	Alenig 12.5 ---	Salrot 12.0 ---	Luzcon 13.0 ---	Poaarc d. 14.0 ---
Caribou scat 23.0 ---	Pothyp d. 20.0 ---	Cetsp brown 19.0 ---	Salrot 17.0 ---	Castet d. 15.5 ---	Dacarc 17.0 ---	Cetisl 19.0 ---	Thasp 20.0 ---	Sphglo 20.0 ---	Litter 19.0 ---
Litter 21.0 ---	Sphglo 20.0 ---	Polalp 19.5 ---	Cetsp 21.0 ---	Lichen 21.0 ---	Castet 18.0 ---	Polstr d. 18.0 ---	Litter 20.0 ---	Aultur 18.0 ---	Litter 16.5 ---
Aultur 22.0 ---	Cetsp brown 19.0 ---	Polalp 21.0 ---	Cetsp brown 21.0 ---	Poaarc d. 21.0 ---	Castet d. 17.0 ---	Thasp 16.5 ---	Alenig 16.5 ---	Luzcon 12.5 --- Cetsp 15.0	Castet 11.0 ---

A 20.0 **B 12.5**

Barrow 1995
ITEX point-quadrat data
Plot: E 22 Date: July 17, 1995
South half of plot

Castet 19.0	Cetsp 18.0	Salrot d. 18.0	Salrot 15.0	Salrot 12.5	Castet 13.5	Castet 13.0	Cetcuc 14.0	Castet 12.5	Castet d. 11.5
Castet d. 18.0	Alenig 19.0	Litter 15.0	Luzcon d. 11.5 Castet 12.0	Luzcon d. 12.5 Litter 13.5	Luzcon d. 11.0 Pohsp. 14.0	Castet 12.0	Dicsp. 14.5	Cetsp brown 14.0	Thasp 12.0
Polalp? 18.0	Litter 16.0	Salrot 15.0	Luzcon d. 11.0 Castet 13.0	Alenig 11.5 Thasp 12.5	Tag 12.0	Salrot 11.0	Thasp 11.5	Thasp 9.5	Alenig 10.5
Castet 17.5	Cetcuc 18.0	Castet 13.5	Castet d. 10.0	Alenig 12.0	Lichen 12.5	Pohsp. 10.0	Orgcru black 10.5	Lichen 9.5	Pohsp. 10.5
Pothyp 14.5 Castet 21.0	Pothyp 17.5 Litter 20.0	Pothyp 12.5 Dicsp.	Pothyp 12.0 Litter 15.0	Alenig 11.5	Brysp. 14.5	Salrot 11.5	Litter 12.0	Orgcru grey 11.0	Stelae 11.0 Salrot 12.0

Barrow 1995
ITEX point-quadrat data
Plot: E 23 Date: July 17 1995
North half of plot

C 16.5 **D 7.9**

Litter 16.5 ---	Castet d. 16.5 ---	Orgcru black 17.5 ---	Litter 14.0 ---	Thasp. 14.0 ---	Orgcru white 11.0 ---	Salrot d. 10.5 ---	Salrot 9.5 ---	Lichen 10.0 ---	Alenig 8.5 ---
Litter 15.0 ---	Litter 16.0 ---	Litter 17.0 ---	Litter 14.0 ---	Litter 13.5 ---	Lichen 12.0 ---	Salrot d. 11.0 ---	Orgcru white 11.0 ---	Stelae 10.5 ---	Stelae 8.5 --- Salrot d. 10.5
Litter 15.0 ---	Salrot 14.0 ---	Alenig 14.5 ---	Luzcon 14.0 --- Litter 15.0	Litter 16.0 ---	Stone 15.5 ---	Orgcru white 13.5 ---	Aultur 13.0 ---	Alenig 12.5 ---	Castet d. 16.0 ---
Litter 17.0 ---	Salrot 15.5 ---	Alenig 15.0 ---	Luzcon d. 13.5 ---	Alenig 13.0 ---	Bare ground 16.0 ---	Bare ground 16.0 ---	Litter 14.0 ---	Castet d. 15.0 ---	Castet d. 14.5 ---
Bare ground 19.0 ---	Stelae d. 17.0 ---	Salrot 17.5 ---	Stelae d. 16.0 ---	Salrot 16.0 ---	Salrot 15.0 ---	Castet 14.0 ---	Castet 15.5 --- Dacarc 20.0	Litter 18.5 ---	Castet 19.0 ---

A 24.8 **B 19.4**

Barrow 1995
ITEX point-quadrat data
Plot: E 23 Date: July 17, 1995
South half of plot

Bare ground 20.5	Salrot 17.0	Castet d. 17.0	Castet 17.5	Castet d. 19.0	Stelae d. 19.0	Castet 18.5	Salrot 20.0	Salrot d. 20.0	Litter 23.0
			Litter 24.0	Castet d. 21.0	Brysp. 24.0	Litter 24.0			
Bare ground 20.5	Alenig 18.0	Castet 19.0	Salrot 20.5	Castet d. 23.0	Timaus 22.5	Orgcru black 24.0	Cetcuc 25.0	Thasp. 24.0	Dicsp. 21.5
Litter 19.5	Thasp. 20.5	**Tag** 21.0	Salrot 21.5	Aultur 23.5	**Tag** 23.0	Litter 23.5	Cetsp. brown 22.0	Raclan 23.5	Castet 17.0 Thasp. 19.5
Salrot d. 21.5	Castet 21.0	Castet 18.5	Litter 21.0	Alenig 19.0 Litter 23.0	Castet d. 20.0	Dacarc 21.5	Litter 20.5	Castet 19.0	Castet 20.0
Thasp. 26.5	Castet 21.0 Castet d. 22.5	Castet 19.5 Castet d. 21.0	Castet d. 19.5	Castet d. 19.5	Castet 20.5	Pothyp 19.0 Moss 21.5	Salrot d. 20.0	Castet 17.5 Litter 20.5	Castet d. 21.0

Barrow 1995
ITEX point-quadrat data
Plot: E 24 Date: July 16, 1995
North half of plot

C 8.6 **D 7.1**

Dacarc 11.0 ---	Thasp 11.0 ---	Salrot 11.5 ---	Orgcru white 15.0 ---	Litter 16.5 ---	Orgcru white 13.0 ---	Castet 11.5 ---	Castet 10.5 ---	Castet 10.0 ---	Litter 9.5 ---
Salrot 12.0 ---	Salrot 13.0 ---	Moss? 12.5 ---	Litter 14.0 ---	Litter 15.5 ---	Luzcon d. 14.0 --- Litter 15.0	Litter 13.0 ---	Castet 12.0 ---	Castet 14.0 ---	**Tag** 11.0 --- -
Salrot d. 10.0 ---	Salrot 10.5 ---	Litter 12.0 ---	Orgcru white 13.0 ---	Castet d. 13.0 ---	Orgcru white 12.0 ---	Dicsp. 13.0 ---	Papsp. 14.0 --- Litter 15.5	Luzarc 17.0 ---	Luzarc 17.0 ---
Tag 10.5 ---	Bare ground 11.0 ---	Bare ground 12.0 ---	Bare ground 11.5 ---	Litter 13.0 ---	Castet d. 13.0 ---	Pothyp 14.5 ---	Salrot 18.5 ---	Salrot 19.0 ---	Pothyp d. 12.0 --- Pothyp 17.0
Bare ground 11.0 ---	Orgcru white 11.0 ---	Luzarc 10.0 --- Orgcru white 11.0	Timaus 11.0 ---	Thasp 12.5 ---	Litter 18.0 ---	Thasp 20.0 ---	Orgcru white 19.0 ---	Alenig 18.0 ---	Dacarc 18.0 ---

A 12.6 **B 6.4**

Barrow 1995
ITEX point-quadrat data
Plot: E 24 Date: July 16, 1995
South half of plot

Luzcon 8.5 --- Litter 10.5	Sanunc 9.5 ---	Brysp. 10.0 ---	Litter 9.5 ---	Dicsp. 12.0 ---	Castet d. 17.0 ---	Litter 20.0 ---	Orgcru grey 17.5 ---	Arclat 12.5 --- Litter 17.5	Salrot 13.0 ---
Thasp 8.5 ---	Alenig 9.0 ---	Poaarc 8.0 --- Litter 10.5	Luzcon 9.5 --- Dicsp. 10.0	Castet 13.5 ---	Castet 15.5 --- Castet 20.0	Litter 19.0 ---	**Tag** 17.5 ---	Castet 11.5 ---	Salrot d. 9.0 ---
Salrot 9.0 ---	Arclat d. 5.0 --- Arclat d. 10.0	Salrot 10.0 ---	Salrot d. 13.0 ---	Castet 16.5 ---	Litter 19.0 ---	Poaarc d. 16.0 --- Litter 18.0	Timaus 16.5 ---	Litter 11.5 ---	Alenig 6.5 ---
Pothyp 8.5 --- Litter 11.0	Litter 13.5 ---	Litter 17.5 ---	Salrot 15.5 ---	Castet d. 17.0 ---	Castet 14.5 ---	Litter 14.0 ---	Stelae 11.0 --- Litter 13.0	Litter 9.0 ---	Sphglo 6.5 ---
Salrot 13.0 ---	Luzcon d. 15.0 --- Salrot 15.5	Alenig 17.0 ---	Litter 24.0 ---	Castet 13.0 ---	Castet 12.0 ---	Poaarc d. 7.5 --- Thasp 8.5	Litter 9.0 ---	Castet 6.0 ---	Pothyp 4.5 --- Dacarc 5.0

Barrow 1995
ITEX point-quadrat data
Plot: C 1 Date: August 14, 1995
North half of plot

C 11.0 **D 14.0**

Litter 13.5	**Tag** 13	Salrot 11.5	Salrot 13	Alenig 11	Dicsp 12	Poaarc d. 12.5	Pothyp d. 15	Salrot d. 15	Salrot d. 15
Litter 13	Salrot d. 12	Arclat 11.5	Salrot 12.5	Pothyp 11	Luzcon 11	Stelae 15	**Tag** 17.5	Alenig 16	Litter 15
Salrot 11	Stelae d. 11	Salrot 12	Stelae 13	Salrot d. 14	Thasp 16	Pothyp 17.5	Alenig 17	Salrot 15	Alenig 15
Arclat d. 12.5	Salrot d. 13	Arclat d. 14	Salrot 14.5	Salrot 15	Wire	Pothyp 18	Salrot 17.5	Salrot d. 16	Pol?alp 14.5
Alenig 15	Dacarc 16	Thasp 17	Salrot 17	Salrot d. 16	Salrot d. 17.5	Salrot d. 17.5	Luzcon 17	Lichen 16	Salrot 15.5

A 18.5 **B 13.5**

Barrow 1995
ITEX point-quadrat data
Plot: C 1 Date: August 14, 1995
South half of plot

Poaarc d. 18.5	Dacarc 16.5	Litter 17.5	Litter 17	Salrot 18	Aultur 18	Alenig 15	Litter 15.5	Salrot 15	Stelae d. 15
Salrot 20	Thasp 19	Salrot 17.5	Pohsp 16	Dacarc 16	Castet 17	Castet 13.5	Castet 14.5	Castet 13	Sphglo 14
Cetisl 20	Salrot 18	Litter 16.5	Raclan 16	Litter 18	Litter 19	Castet 13	Castet 14	Castet 13	Thasp 15
Salrot 20.5	Stelae d. 16	Aultur 14.5	Salrot 14.5	Dacarc 17	Alenig 18	Alenig 15	Luzcon d. 13.5	Salrot 14	Luzcon d. 14.5
Litter 20.5	Pohsp 17.5	Thasp 18	Poaarc 19	**Tag** 18.5	Alenig 17	Thasp 17	Junbig 14	Salrot 16.5	Sphglo 15

Barrow 1995
ITEX point-quadrat data
Plot: C 2 Date: August 14, 1995
North half of plot

C 17.0 **D 9.0**

Dicsp 17 ---	Dicsp 17 ---	**Tag** 16.5 ---	Salrot d. 15.5 ---	Alenig 13 ---	Raclan 14 ---	Aloalp d. 13 ---	Salrot 11.5 ---	**Tag** 12 ---	Cetisl 11 ---
Dicsp 18 ---	Salrot d. 17 ---	Salrot 16.5 ---	Salrot d. 15 ---	Salrot d. 14.5 ---	Raclan 14 ---	Cetisl 14.5 ---	Salrot 12 ---	Salrot d. 11 ---	Salrot d. 12 ---
Salrot 16 ---	Aloalp 16 ---	Salrot 17 ---	Litter 16 ---	Salrot 14.5 ---	Litter 15.5 ---	Salrot d. 15 ---	Dicsp 14 ---	Salrot 13.5 ---	Salrot d. 11 ---
Dicsp 16.5 ---	Dicsp 16.5 ---	Salrot 17.5 ---	Thasp 17 ---	Salrot 16 ---	Salrot 14.5 ---	Cetcuc 13.5 ---	Castet 12.5 ---	Castet d. 12 ---	Cetcuc 11 ---
Salrot 18 ---	Litter 17 ---	Dicsp 17 ---	Aloapl 16.5 ---	Litter 16 ---	Salrot 14 ---	Oncwah 14 ---	Arclat d. 13 ---	Castet 11 ---	Arclat d. 10.5 ---

A 14.5 **B 13.4**

Barrow 1995
ITEX point-quadrat data
Plot: C 2 Date: August 14, 1995
South half of plot

Salrot 18	Salrot 16.5	Salrot 15.5	Poaarc 15	Raclan 14	Dacarc 14	Castet 13.5	Castet 11	Arclat 13	Salrot 13
Arclat 16.5	Salrot 16	Aultur 16	Arclat 13	Arclat 12	Castet 11	Castet 14.5	Castet 14	Salrot 13	Saxpun 14
Arclat 15.5	Arclat 13	Stereo 16	Luzcon 13.5	Luzcon d. 11	Stelae d. 11.5	Litter 15	Alenig 12.5	Bare ground 14	Arclat d. 11 --- Castet 14
Luzarc 15	Salrot 16	Raclan 14	Pohsp 13	Arclat 10	Litter 12	Thasp 11.5	**Tag** 12	Salrot 13	Litter 15
Dacarc 16	Dacarc 17.5	**Tag** 17.5	Pohsp 14.5	Arclat d. 11	Arclat 8	Salrot 11	Thasp 13.5	Aultur 13	Litter 17

Barrow 1995
ITEX point-quadrat data
Plot: C 3 Date: August 14, 1995
North half of plot

C 14.0 **D 7.0**

Hepatic leafy 13	Salrot d. 16	Lichen 14.5	Pohsp 12.5	Pohsp 12	Litter 13	Raclan 12.5	Sphglo 10	Litter 10.5	Salrot 9
Salrot d. 12	Arclat d. 12	Castet d. 12.5	Litter 14	**Tag** 15	Castet 12	Luzcon d. 12	**Tag** 12	Dacarc 11.5	Dicra? 10
Salrot d. 11	Orgcru white 11.5	Poaarc d. 12.5	Orgcru white 15	Poaarc d. 13.5	Castet 13	Castet 12	Litter 13	Luzcon d 14.5	Salrot 12
Dicra? 13	Dicra? 13	Salrot 14	Alenig 14	Castet d. 13.5	Luzcon d. 14	Litter 13	Alenig 12.5	Cetsp 13	Stelae d. 11.5
Poaarc d. 15	Alenig 14	Salrot 15	Stone 16	Bare ground 15.5	Castet 14	Castet d. 14	Alenig 12	Dacarc 12	Bryum? 12

A 17.6 **B 13.2**

Barrow 1995
ITEX point-quadrat data
Plot: C 3 Date: August 14, 1995
South half of plot

Salrot 16.5 ---	Salrot 15 ---	Litter 15.5 ---	Castet d. 14.5 ---	Bare ground 13 ---	Stone 13.5 ---	Castet 12 ---	Castet 12.5 ---	Castet 14 ---	Luzcon 14.5 ---
Arclat d. 14.5 ---	Litter 15.5 ---	Sphglo 13 ---	Raclan d. 12.5 ---	Raclan 14 ---	**Tag** 14 ---	Stelae 13.5 ---	Thasp 12 ---	Dacarc 13 ---	Thasp 13 ---
Salrot 16.5 ---	Salrot 16.5 ---	Litter 14.5 ---	Salrot 12 ---	Salrot 13.5 ---	Lichen white 13 ---	Luzcon 11 ---	Litter 13 ---	Salrot 13 ---	Salrot 13.5 ---
Thasp 16.5 ---	Pothyp 17 ---	Lichen 17 ---	Luzcon d. 16 ---	Orgcru black 14 ---	Salrot 14 ---	Thasp 13 ---	Thasp 13 ---	Salrot 13 ---	Raclan 12.5 ---
Salrot 17.5 ---	Litter 18 ---	Salrot d. 17 ---	Salrot 15 ---	Litter 16.5 ---	Thasp 15.5 ---	Alenig 14.5 ---	Luzcon 12 ---	Dicsp 13 ---	Dicsp 13.5 ---

Barrow 1995
ITEX point-quadrat data
Plot: C 4 Date: August 13, 1995
North half of plot

C 12.2 **D 10.7**

Orgcru grey 14	**Tag** 13	Stelae 13.5	Alenig 13	Salrot d. 13	Lichen 13	Sphglo 14.5	**Tag** 14	Salrot d. 13	Castet ?
Orgcru grey 14	Stone 13	Paphul 12	Salrot 14	Orgcru grey 15	Thasp 14	Salrot 14.5	Carsta d. 14.5	Castet 13	Castet 15
Stone 15	Bare ground 14	Alenig 14.5	Alenig 15	Luzcon d. 13.5	Dicra? 14	Stelae 14	Castet 13.5	Castet d. 15	Castet d. 14
Orgcru grey 14	Litter 15.5	Stelae 17	Litter 15	Carsta d. 13	Salrot 13	Stelae 13.5	Castet d. 12	Castet 12.5	Castet d. 14
Salrot d. 15	Salrot 14.5	Salrot 16	Castet d. 16	Alenig 15.5	Salrot 14.5	Salrot 15.5	Thasp 14	Castet d. 16	Dacarc 15

A 16.2 **B 13.5**

Barrow 1995
ITEX point-quadrat data
Plot: C 4 Date: August 13, 1995
South half of plot

Litter 15.5	Litter 15.5	Salrot 14.5	Castet 14	Dicra? 16.5	Litter 17	Salrot 16.5	Litter 17	Salrot 16	Hylspl 18.5
Thasp 14	Lichen 14	Orgcru grey 16	Castet 14.5	Castet d. 16	Castet 16	Litter 17	Dacarc 18	Sphglo 17	Salrot 17
Luzcon 14.5	Orgcru grey 16.5	Lichen 17	Salrot 17	Castet 17	Litter 17	Litter 17	Hylspl 18	Lichen 18	Sphglo 16.5
Litter 17.5	Moss 18	Sphglo 17	**Tag** 18	Salrot 17.5	Senatr 16.5	Salrot 16.5	Castet 17	Raclan 16.5	Salrot 15
Arclat 13.5 Bare ground 19	Stone 18	Litter 17.5	Cetcuc 17.5	Cetcuc 19	Salrot 19.5	Senatr 18	Cetisl 20	Castet 17	Salrot d. 17.5

Barrow 1995
ITEX point-quadrat data
Plot: C 5 Date: August 10, 1995
North half of plot

C 17.9 **D 13.8**

Thasp 19.0 ---	Litter 18.0 ---	Salrot 17.0 ---	Salrot 15.0 ---	Arclat dead 14.0 ---	**Tag** 17.5 ---	Salrot 17.0 ---	Oncwah 16.0 ---	Salrot 15.0 ---	Thasp 15.5 ---
Stell 18.0 ---	Orgcru whi 17.0 ---	Oncwah 17.0 ---	Onswah 16.0 ---	Salrot 17.0 ---	Thasp 19.5 ---	Luzcon dead 16.5 ---	Alenig 16.5 ---	Luzcon dead 16.5 ---	Orgcru bro 18.5 ---
Dicsp. 19.0 ---	Dacarc 17.0 ---	**Tag** 15.5 ---	Dicsp. 15.5 ---	Pothyp dead 15.5 ---	Stesp. 19.5 ---	Thasp 17.5 ---	Salrot dead 18.0 ---	Dicsp. 21.5 ---	Dacarc 21.5 ---
Dacarc 18.0 ---	Thasp 15.0 ---	Orgcru bro 15.0 ---	Salrot 15.5 ---	Dicsp. 17.0 ---	Salrot 19.0 ---	Stesp. 18.5 ---	Thasp 19.0 ---	Aultur 21.0 ---	Hylspl 21.0 ---
Raclan 16.0 ---	Hylspl 14.5 ---	Caribou feces 13.5 ---	Hylspl 15.5 ---	Raclan 17.5 ---	Castet 16.0 ---	Aloalp 17.5 ---	Castet 17.5 ---	Castet 19.5 ---	Castet 19.5 ---

A 17.5 **B 15.7**

Barrow 1995
ITEX point-quadrat data
Plot: C 5 Date: August 10, 1995
South half of plot

Salrot 16.5	Litter 16.5	Arclat 13.0	Dacarc 16.5	Castet 15.0	Castet 15.0	Hylspl 18.0	Castet 18.5	Salrot dead 19.5	Castet 19.5
Litter 19.0	Salrot 18.5	Orgcru whi 18.5	Litter 20.0	Dacarc 18.0	Litter 19.5	Dacarc 19.5	Castet 18.0	Castet 16.0 Hylspl 19.0	Aultur 18.0
Litter 20.0	Senatr 19.0	Salrot 20.0	Litter 20.0	Litter 20.5	Hylspl 20.5	Alenig 19.5	Castet 19.5	Castet dead 16.0	Hylspl 17.5
Litter 20.0	Luzcon dead 16.0	Salrot 19.5	**Tag** 21.5	Dacarc 20.0	Salrot 19.0	Castet dead 20.5	Dacarc 19.0	Hylspl 18.0	Castet 17.0
Orgcru whi 19.0	Salrot 18.0	Pothyp 19.5	Hylspl 21.0	Luzcon dead 17.5 Salrot 22.0	Castet dead 21.0	Castet 19.0	Salrot 17.0	Pothyp 16.0	Castet dead 16.0

Barrow 1995
ITEX point-quadrat data
Plot: C 6 Date: August 10, 1995
North half of plot

C 16.6 **D 7.5**

Cetcuc 18	Cetcuc 17.5	Cetsp 16	**Tag** 14	Litter 15.5	Litter 14	Salrot d. 12.5	Orgcru black 10	Cetcuc 10	Orgcru black 9
Poaarc d. 18	Alenig 16.5	Hylspl 16	Lichen 16.5	Cetcuc 15.5	Salrot d. 13	**Tag** 23 (?)	Cetcuc 10	Alenig 11	Cetcuc 9
Litter 16	Dicsp 16	Thasp 17	Poaarc 16	Orgcru white 16.5	Dicsp 12.5	Salrot 11.5	Orgcru white 12.5	Orgcru grey 12	Steel wire 11.5
Cetisl 14.5	Salrot 15	Dicsp 16	Litter 17	Raclan 14	Carsta 12	Alenig 12	Alenig 14	Castet d. 12	Luzcon 6 Cladsp 10.5
Salrot 15	Salrot d. 13.5	Litter 14	Cetsp 13.5	Salrot 13	Orgcru black 14	Castet 13	Castet d. 17	Castet 12.5	Raclan 12

A 18.0 **B 11.7**

Barrow 1995
ITEX point-quadrat data
Plot: C 6 Date: August 10, 1995
South half of plot

Raclan 16.5	Luzcon d. 13	Alenig 14.5	Hylspl 15.5	Salrot 14.5	Castet 15	Castet d. 17	Dacarc 15	Dacarc 14.5	Raclan 13
Salrot 16.5	Raclan 16.5	Raclan 18	Sphglo 17	Dacarc 15	Stelae d. 16	Castet 15.5	Thasp 13.5	Raclan 13	Raclan 12
Dicra? 17.5	Litter 19	Dacarc 20	Stelae 18	Lichen 16.5	**Tag** 16	Cetsp 15.5	Alenig 13.5	Luzcon d. 11	Castet 11
Salrot 19.5	**Tag** 19.5	Sphglo 19.5	Alenig 17.5	Litter 15.5	Hylspl 15.5	Raclan 15	Dacarc 14	Hylspl 14	Raclan 12
Alenig 20.5	Stereo 20.5	Alenig 21.5	Luzcon 21	?Moss 17	Castet 14	Cetcuc 15	Salrot 15	Luzcon d. 13.5	Alenig 13.5

Barrow 1995
ITEX point-quadrat data
Plot: C 7 Date: August 12, 1995
North half of plot

C 12.0 **D 10.6**

Salrot 14.5	Salrot 15.5	**Tag** 16	Salrot 13.5	Salrot d. 12.5	Luzcon 11	Poaarc 10.5	**Tag** 11	Hyl?spl 11	Salrot d. 13
Arclat d. 15	Alenig 15.5	Alenig 15.5	Hylspl 14.5	Cetcuc 13	Salrot d. 11.5	Litter 11.5	Salrot 11	Salrot d. 12	Orgcru white 13.5
Litter 15	Alenig 14.5	Thasp 15.5	Cetsp 14.5	Salrot d. 14.5	Cetcuc 12	Salrot 12.5	Salrot 12.5	Luzcon 12.5	Cetsp 13
Cetcuc 15	Cetsp 14	Luzcon 15	Luzcon d. 14	Sphglo 14	Luzcon 12.5	Luzcon 13	Cetcuc 12	Pticil 11.5	Orgcru whiter 12.5
Alenig 15	Luzcon d. 14.5	Senatr 14.5	Salrot d. 14	Tomnit 13.5	Pothyp 12.5 Litter 14	Thasp 13	Luzcon 12.5	Salrot 12	Salrot 12.5

A 16.7 **B 11.0**

Barrow 1995
ITEX point-quadrat data
Plot: C 7 Date: August 12, 1995
South half of plot

Hylspl 17 ---	Sphglo 15 ---	Salrot d. 13.5 ---	Castet 11 ---	Senatr 13 ---	Cetsp 12.5 ---	Hylspl 13 ---	Hylspl 13 ---	Hylspl 13 ---	Salrot d. 13.5 ---
Salrot 17 ---	Cetcuc 15.5 ---	Cetisl 12 ---	Hylspl 12.5 ---	Castet 12 ---	Castet 14 ---	Castet 14 ---	Dacarc 13 ---	Castet 11 ---	Castet 12.5 ---
Alenig 15 ---	Alenig 12 ---	Dacarc 12 ---	Cetsp 12.5 ---	Castet 11.5 ---	Caribou scat 13.5 ---	Castet 11.5 ---	Castet 11.5 ---	Castet 13 ---	Cetcuc 13.5 ---
Salrot 16 ---	Castet 13 ---	Castet 13.5 ---	Castet 11.5 ---	Castet d. 12 ---	Litter 12.5 ---	Castet d. 14 ---	Castet 13.5 ---	Cetcuc 12.5 ---	Hylspl 13 ---
Alenig 15.5 ---	Salrot 14 ---	Alenig 11 ---	Castet 12 ---	Salrot 14 ---	**Tag** 14.5 ---	Castet 15 ---	Castet 13.5 ---	Castet 12.5 ---	Dacarc 11.5 ---

Barrow 1995
ITEX point-quadrat data
Plot: C 8 Date: August 10, 1995
North half of plot

C 14.6 **D 8.2**

Stelae	Salrot	Alenig	**Tag**	Castet dead	Alenig	Litter	Dacarc	Luzcon dead	Castet
16.0	15.0	15.0	16.0	15.0	15.0	16.0	13.0	10.0	9.0
---	---	---	---	---	---	---	---	---	---
Arclat dead	Alenig	Cetcuc	Stelae dead	Salrot	Litter	Castet dead	Litter	Castet	Castet
19.0	16.0	16.5	15.0	16.5	17.0	16.5	14.0	9.5	10.0
---	---	---	---	---	---	---	---	---	---
Cetcuc	Arclat dead	Arclat	Stelae dead	Salrot	**Tag**	Alenig	Arclat dead	Castet	Stelae
24.5	17.5	16.5	17.0	16.5	18.0	15.0	14.0	11.5	10.0
---	---	---	---	---	---	---	---	---	---
?Pelsp	Dacarc	Dacarc	Dacarc	Arclat dead	Cetisl	Castet	Castet dead	Castet dead	Castet
23.0	19.5	20.5	18.0	16.5	18.0	12.0	12.0	11.0	12.0
---	---	---	---	---	---	---	---	---	---
Aultur	Salrot	Salrot	Salrot dead	Castet	Cetisl	Stelae	Castet	Castet	Castet
21.0	17.5	18.0	17.0	17.0	15.0	13.0	11.5	11.5	10.5
---	---	---	---	---	---	---	---	---	---

A 20.6 **B 12.7**

Barrow 1995
ITEX point-quadrat data
Plot: C 8 Date: August 10, 1995
South half of plot

?	Salrot	Alenig	Cetcuc	Alenig	Salrot dead	Alenig	Castet dead	Salrot dead	Castet
---	17.0	16.0	16.5	16.5	17.0	13.5	13.0	11.0	11.0
	---	---	---	---	---	---	---	---	---
Thasp	Alenig	Senatr	Cetsp brown	Litter	Dacarc	Thasp	Castet dead	Litter	Salrot
22.0	22.5	18.0	17.0	18.0	17.0	13.5	14.0	13.5	10.5
---	---	---	---	---	---	---	---	---	---
Aultur	Salrot	Stelae	Orgcru grey	Litter	**Tag**	Litter	Alenig	Raclan	Litter
23.5	20.0	19.5	18.0	18.0	16.0	15	11.5	12.0	13.0
---	---	---	---	---	---	---	---	---	---
Salrot	Sphglo	Arclat dead	Salrot	Litter	Arclat dead	Raclan	Raclan	Salrot	Pebble
21.5	21.0	18.5	16.5	12.5	12.5	12.5	12.0	10.0	13.5
---	---	---	---	---	---	---	---	---	---
Cetcuc	?hepatic	Salrot	Arclat dead	Luzcon dead	Dacarc	Cetcuc	Arclat	Litter	Stelae
21.0	19.5	17.0	14.0	14.0	12.0	12.0	8.0	12.5	13.0
---	---	---	---	---	---	---	---	---	---

Barrow 1995
ITEX point-quadrat data
Plot: C 9 Date: August 7, 1995
North half of plot

C 13.3 **D 11.8**

Salrot 14	Bare ground 15	Stone 17	Thasp 15	Salrot 14	Raclan 16.5	Litter 18	Alenig 20	Litter 18.5	Alenig 15.5
Alenig 15	**Tag** 15	Bare ground 15	Orgcru black 14	Orgcru white 14	Lichen 15	Hylspl 17.5	Alenig 18	Cetcuc 16	Litter 15.5
Stone 14	Stone 13.5	Bare ground 13.5	Salrot 13	Salrot 13.5	Litter 15	Litter 18	**Tag** 21.5	Lichen 19	Alenig 12.5
Orgcru white 12.5	Stone 14	Bare ground 15	Alenig 15	Salrot 15	Cetisl 15	Litter 20	Hylspl 19	Cetcuc 17	Litter 13.5
Pothyp 14	Thasp 13.5	Thasp 15	Pedkan 14	Alenig 14.5	Dacarc 18	Cetsp 19.5	Alenig 17	Dacarc 16	Salrot 13.5

A 17.5 **B 13.4**

Barrow 1995
ITEX point-quadrat data
Plot: C 9 Date: August 7, 1995
South half of plot

Salrot 18.5	Orgcru grey 17	Stelae d. 17.5	Dramic 16.5	Salrot 18.5	Alenig 20	Dacarc 22.5	Stelae 17	Alenig 16.5	Salrot 15
Pothyp 20.5	Stelae d. 20.5	Salrot 19.5	Stelae 19.5	Alenig 18	Dacarc 18.5	Castet d. 21	Castet d. 18.5	Castet 16 Litter 19.5	Hylspl 16.5
Orgcru white 19.5	**Tag** 19	Sanunc 19	Salrot 17.5	Salrot 16	Pedkan 15.5	Thasp 17	Castet 14 Thasp 18.5	Dacarc 14.5	Castet d. 13
Luzarc d. 18.5	Orgcru grey 16.5	Stelae 18	Litter 17	Stelae 15	Castet 15.5	Cetcuc 15	Alenig 15	Castet 12.5	Castet d. 13
Salrot 19	Hypnsp d. 15.5	Dicrsp 18	Salrot 16	Litter 16	Castet d. 17.5	Castet 18.5	Pedkan 16.5	Litter 17	Stone 15

Barrow 1995
ITEX point-quadrat data
Plot: C 10 Date: August 7, 1995
North half of plot

C 12.7 **D 12.5**

Salrot d. 14	Bare ground 14	Pedkan 14	Cetcuc 14.5	Cetcuc 15.5	Litter 18	Litter 16.5	Salrot 15	Salrot 14	Cladon 14
Dicsp 15.5	**Tag** 16	Junbig 16	Thasp 17	Salrot 18.5	Alenig 19	Dicra? 18.5	Salrot 15	Arclat d. 13.5	Litter 14
Salrot 17	Salrot 16	**Tag** 16.5	Litter 18	Parsku d. 17.5	Cetcuc 19.5	Litter 20.5	Castet 11.5 Raclan 16.5	Arclat d. 12.5	Arclat d. 11.5
Salrot 17	Salrot 15.5	Hylspl 16.5	Salrot 14.5	Salrot 14	Luzarc 17	Thasp 20	Castet 16	Litter 12	Alenig 11
Luzcon d. 15	Cetcuc 16	Thasp 15	Salrot d. 14.5	Salrot 14	Dacarc 14	Pothyp 16	Castet 15	Castet 13	Castet 12

A 16.6 **B 19.9**

Barrow 1995
ITEX point-quadrat data
Plot: C 10 Date: August 7, 1995
South half of plot

Cetcuc 17	Thasp 15	Dacarc 16.5	Salrot 15.5	Orgcru 14.5	Castet 15.5	Castet 16	Stelae 16	Castet 14	Bare ground 14.5
Salrot d. 15.5	Pothyp 17	Stone 18	Bare ground 19	Castet 16.5	Castet 16 Dacarc 19.5	Cetsp 18.5	Castet 16.5	Castet 16.5	Stone 16.5
Pedkan 16	Moss 17.5	Salrot d. 17	Orgcru 17	Salrot 18	Litter 20	Arclat d. 17.5 Cetsp. 19	Salrot 17	Castet 16	Castet 13 Castet 17.5
Salrot 18	Thasp 18	Castet 17.5	Castet d. 17.5	Castet 17.5	**Tag** 20	Litter 19.5	Orgcru 19.5	Castet 16	Castet 16
Salrot 17	Salrot 18.5	Bare ground 19	Cetsp. 17.5	Cetsp. 18	Alenig 18	Moss 20.5	Dacarc 21	Senatr 20	Moss 21

B. Murray has only two identifications of "moss"; we have three - making it impossibly to refer the two to positions.
1: *Saninia uncinata*, 2: *Hypogymnia subobscura*

Barrow 1995
ITEX point-quadrat data
Plot: C 11 Date: August 11, 1995
North half of plot

C 17.5 **D 12.7**

Dicsp. 18.5	**Tag** 18.0	Thasp 17.5	Stelae 16	Litter 16	Litter 16	Stone 14	Bare ground 14.5	Raclan d. 15.5	Bare ground 15
Bare ground 18.5	Litter 18.5	Salrot 16	Luzcon d. 14	Cetsp 15	Lichen 14.5	Bare ground 15	**Tag** 14.5	Bare ground 14	Stone 13.5
Thasp 18.5	Salrot d. 17	Salrot 17	Arclat d. 15	Castet 14.5	Raclan d. 14.5	Alenig 14	Litter 14.5	Stelae 12.5	Salrot 11.5
Luzcon 18.5	Alenig 17.5	Litter 18.5	Salrot 17	Castet 16.5	Castet 13.5	Alenig 12.5	Salrot 13	Castet 111.5	Arclat d. 10
Alenig 19	Salrot 19	Salrot 17	Cetcuc 16.5	Salrot 17	Litter 15.5	Castet 11	Castet 11	Castet 9.5	Thasp 9

A 15.9 **B 13.5**

Barrow 1995
ITEX point-quadrat data
Plot: C 11 Date: August 8, 1995
South half of plot

Dacarc 19.5	Alenig 18.5	Thasp 17.5	Litter 18	Thasp 16	Castet 14.5	Thasp 12	Luzarc d. 11	Alenig 10	Alenig 9.5
Sphglo 16.5	Alenig 16	Stelae d. 17	Castet d. 16	Dicsp 16	Castet d. 13.5	**Tag** 14	Pothyp 13	Castet d. 11	Alenig 9.5
Stone 16.5	Polalp? 16	Alenig 14	Salrot 14	Litter 14.5	Castet d. 12.5	Castet d. 13	Alenig 13	Castet d. 9.5	Stelae d. 9
Salrot 17	Dacarc 14	Pedkan 14.5	Salrot 15	Castet 15.5 Stelae 18	Parsku 14.5	Litter 15.5	Salrot 13.5	Luzcon d. 11	Litter 13
Castet 17.5	Litter 16.5	Cetcuc 15.5	Polalp? 15.5	Castet 15.5	Raclan 18	Sphglo 17.5	Litter 15	Stelae 12.5	Luzcon d. 12.5

Barrow 1995
ITEX point-quadrat data
Plot: C 12 Date: August 6, 1995
North half of plot

C 15.1 **D 16.8**

Castet 13.5	Caribou 14.5	Salrot 15.5	Aultur 16	Aultur 17.5	Litter 18	**Tag** 18	Castet d. 16	Castet 14.5	Hylspl 16
Cetcuc 15.5	Hylspl 15	Pothyp 16	Aultur 17	Caribou 16	Castet d. 15	Castet d. 15	Castet d. 14	Castet d. 14.5	Salrot d. 15
Castet 15	**Tag** 17.5	Castet d. 15.5	Thasp. 15.5	Alenig 15	Castet 12	Castet 11.5	Castet 13	Alenig 14.5	Castet d. 13
Dacarc 16.5	Hylspl 17.5	Castet 14.5	Castet 13.5	Cetsp 12.5	Salrot 13	Orgcru 12.5	Raclan d. 13.5	Castet 13.5	Castet 12.5
Aultur 16.5	Cetisl 16	Alenig 15	Tomnit 15	Pothyp 12	Pothyp 12.5	Alenig 13	Alenig 12	Dacarc 12.5	Alenig 14

A 10.6 **B 10.0**

Barrow 1995
ITEX point-quadrat data
Plot: C 12 Date: August 6, 1995
South half of plot

Cetsp 14 ---	Thasp 14.5 ---	Salrot d. 14.5 ---	Hylspl 13.5 ---	Hylspl 13.5 ---	Sanunc 13.5 ---	Salrot d. 14 ---	Salrot 12.5 ---	Stelae 12.5 ---	Litter 16 ---
Salrot d. 13.5 ---	Orgcru black 14 ---	Salrot 12 ---	Stelae d. 11.5 ---	Castet 11.5 ---	Stelae d. 12 ---	Saxpun 15 ---	Salrot d. 15 ---	Alenig 14.5 ---	Moss d. 17 ---
Cetcuc 13 ---	Litter 14 ---	Litter 13.5 ---	Thasp 12.5 ---	Castet 11.5 ---	Luzcon d. 12.5 ---	Litter 17 ---	Thasp 16.5 ---	Cetisl 17 ---	Pothyp 15 ---
Stone 16 ---	Cetcuc 13 ---	Luzarc 11 ---	**Tag** 13 ---	Cetisl 11 ---	Sphglo 11 ---	**Tag** 11.5 ---	Polalp? 13.5 ---	Alenig 14 ---	Pothyp 12.5 --- Litter 16.5
Stone 15 ---	Pohsp. 13 ---	Salrot 13.5 ---	Salrot 13.5 ---	Stelae 12.5 ---	Cetcuc 11 ---	Salrot d. 11.5 ---	Alenig 12 ---	Alenig 13 ---	Pothyp 9 --- Pothyp 11.5

Barrow 1995
ITEX point-quadrat data
Plot: C 13 Date: August 6, 1995
North half of plot

C 16.5 **D 7.9**

Cetcuc 19.5	Dacarc 18	Orgcru white 17.5	Salrot d. 15.5	Alenig 13	Castet 10	Arclat d. 9	Salrot 11	Aultur 9.5	Cetsp 9.5
Hylspl d. ?	Cetsp 17	Cetsp 17	Cetcuc 13.5	Cetcuc 16 Cetsp 11	Salrot 9.5	Litter 10	Castet 9.5	Dacarc 9	Raclan d. 10
Thasp 17	Cetisl 15	Cetcuc 14.5	Castet d. 14.5	Arclat d. 9.5	Litter 11	**Tag** 12	Litter 11	Castet 10.5	Castet 11.5
Cetsp 14.5	Arclat 11 Castet 13.5	Castet 12.5	Pelsp 11	Castet d. 10.5	Salrot 11	Cetsp 10.5	Dacarc 10.5	Raclan d. 11.5	Hylspl d. 13.5
Arclat 8.5 Castet 12	Arclat d. 10	Arclat 10	Castet 10	Castet 9.5	Luzcon d. 10	Castet d. 11.5	Castet 10.5	Castet 10	Castet d. 13.5

A 12.6 **B 11.0**

Barrow 1995
ITEX point-quadrat data
Plot: C 13 Date: August 6, 1995
South half of plot

Litter 12.5 ---	Alenig 11.5 ---	Luzcon 11 --- Salrot d. 13.5	Saxpun 11 ---	Salrot d. 10.5 ---	Luzcon 7.5 --- Stelae 11	Stelae d. 9.5 ---	Stone 12 ---	Orgcru white 11.5 ---	Castet 10 ---
Castet 12.5 ---	Salrot 14.5 ---	Thasp 15 ---	Dacarc 14 ---	Salrot d. 12 ---	Luzcon d. 10 ---	Arclat 7.5 --- Litter 11.5	Salrot 9.5 ---	Castet d. 10.5 ---	Cetisl 10.5 ---
Castet 13 ---	Raclan 17 ---	Cetsp 17 ---	Castet 13 --- Hylspl 18	Castet 11 ---	Litter 11 ---	**Tag** 10 ---	Salrot 9 ---	Castet d. 9.5 ---	Castet 10.5 ---
Pothyp 15 ---	Cetsp 15 ---	Litter 16 ---	Hylspl 12 ---	Castet 10.5 ---	Lichen 11 ---	Stelae 11 ---	Polalp? 13.5 ---	Salrot 11 ---	Salrot d. 12 ---
Cetsp 15 ---	Luzcon d. 11 --- Litter 15	**Tag** 14 ---	Castet 12.5 ---	Castet d. 11.5 ---	Aultur 14 ---	Castet 15.5 ---	Litter 15 ---	Salrot d. 14 ---	Moss 12 ---

Barrow 1995
ITEX point-quadrat data
Plot: C 14 Date: August 5, 1995
North half of plot

C 13.5 **D 10.4**

Litter 16.5	Luzcon 13.5	Alenig 12.5	Alenig 14	Timaus 14	Salrot 12	Salrot d. 11.5	Salrot 11	Salrot 12	Salrot 11
Castet d. 16	Castet d. 16	Litter 15.5	**Tag** 17	Orgcru white 14.5	Salrot 14	Pothyp 11	Caribou 11	Salrot d. 10	Cetsp 10
Castet 15	Thasp 16	Pelsp 17.5	Sphglo 16	Litter 17	Cetsp 15	Castet d. 9.5	Salrot 8.5	Orgcru white 9	Orgcru black 9
Castet 17	Litter 19	Alenig 17	Dacarc 17.5	Castet 15.5	Castet 8 Stelae 13	Castet 6	Alenig 7	Alenig 7.5	Thasp 7
Castet 13	Alenig 14	Castet d. 14.5	Alenig 13.5	Luzcon d. 11.5	Alenig 8.5	Alenig 7.5	Luzcon d. 7.5	Orgcru black 8	Orgcru white 8

A 13.0 **B 9.8**

Barrow 1995
ITEX point-quadrat data
Plot: C 14 Date: August 5, 1995
South half of plot

Diplsp 16	Castet 12	Castet 12.5	Alenig 11.5	Castet d. 12.5	Alenig 9.5	Salrot 8.5	Alenig 9	Orgcru grey 10.5	Orgcru grey 10.5
Orgcru grey 13.5	Bare ground 15	Castet d. 14	Cetcuc 11.5	Thasp 12	Alenig 9.5	Litter 10.5	Salrot 10	Dacarc 9.5	Orgcru 11
Litter 14	Bare ground 16	Bare ground 15.5	Alenig 11	Castet 11	Castet 10	Castet d. 11	Salrot d. 11	Salrot 10.5	Aultur 10
Salrot 14	**Tag** 14.5	Litter 14.5	Castet d. 11.5	Salrot 11	Castet 13	Castet 13 Litter 18.5	Raclan 14.5	Salrot 9.5	Salrot d. 10.5
Alenig 15	Salrot d. 14	Luzcon d. 13	Salrot 12.5	Salrot d. 13	Salrot d. 14.5	Polysp 13	**Tag** 11.5	Salrot 10	Salrot 11

Barrow 1995
ITEX point-quadrat data
Plot: C 15 Date: July 26, 1995
North half of plot

C 14.2 **D 10.6**

Poaarc 16.5	Pothyp 16	Pothyp d. 15	Luzarc 14	Pothyp 14	Salrot 13.5	Salrot 13	Orgcru white 14	Stone 14	Litter 13
Castet 17.5	Litter 18	**Tag** 18	Litter 17.5	Litter 17	Pothyp 15.5	Pelsp? 14.5	Pelsp? 14.5	Litter 14	Salrot 13.5
Litter 18	Poaarc d. 18	Castet d. 17.5	Litter 18.5	Stelae d. 18.5	Salrot 17	Stelae 15	Alenig 15	Thasp 15	Salrot 15
Salrot 16.5	Castet 17 Dacarc 18	Castet d. 18	Litter 20	Stelae 19	Sanunc 17	Pothyp 17	Castet 17.5	Stesp 18	Salrot 16.5
Salrot 19.5	Stelae 18	Leafy 19.5	Dicsp 19.5	Dacarc 20	Thasp 18	Castet d. 17	Cetcuc 17	Salrot 17.5	Salrot 18

A 23.4 **B 11.9**

Barrow 1995
ITEX point-quadrat data
Plot: C 15 Date: July 26, 1995
South half of plot

Litter 21.5 ---	Pothyp 18.5 ---	Orgcru white 18 ---	Litter 19 ---	Luzarc d. 18.5 ---	Luzcon 17 ---	Castet 15 ---	Salrot d. 17 ---	Litter 18 ---	Brysp 18 ---
Litter 21 ---	Pothyp 19 ---	Orgcru white 19.5 ---	Salrot 17.5 ---	Salrot 19.5 ---	Salrot 19.5 ---	Lichen 20.5 ---	Castet 19.5 ---	**Tag** 18 ---	Salrot 17 ---
Tag 22 ---	Litter 22 ---	Pothyp 19.5 ---	Luzarc 19 ---	Salrot 19 ---	Castet d. 20 ---	Stesp 19 ---	Alenig 16 ---	Arclat 10 --- Castet 16	Litter 15 ---
Litter 22.5 ---	Litter 22 ---	Pothyp 14 --- Litter 23.5	Pothyp d. 16 --- Litter 21.5	Pothyp 16 ---	Castet d. 16 ---	Castet d. 16 ---	Castet d. 14.5 ---	?moss 13.5 ---	Senatr 12 ---
Pothyp 24.5 ---	Salrot 21.5 ---	Luzcon d. 19 ---	Pothyp d. 17 --- Polalp? 18.5	Dicsp 17 ---	Sphglo 14.5 ---	Dacarc 13 ---	Salrot 13.5 ---	Sphglo 13.5 ---	Litter 14 ---

Barrow 1995
ITEX point-quadrat data
Plot: C 16 Date: August 5, 1995
North half of plot

C 16.4 **D 11.1**

Salrot 12.5	Salrot 11	Salrot 11	Litter 11.5	Salrot 10	Salrot 10	Salrot 10	Salrot 10	Salrot 12	Luzcon d. 9.5 Cetcuc 11
Stelae 10.5 Litter 12.5	Salrot 11	Salrot 11	Salrot 11.5	Polap? 11	Salrot 10.5	Salrot 10	Salrot d. 11.5	Salrot 13	Alenig 8.5
Salrot 12.5	Poaarc d. 11	Alenig 10.5	**Tag** 12	Stelae d. 11	Salrot 11.5	Salrot d. 11.5	Polalp? 13.5	Castet d. 13	Salrot 7
Salrot 13	Salrot d. 11	Sphglo 10	Salrot d. 10	Alenig 10	Polalp? 11.5	Thasp 12.5	Hylspl 14	Luzcon d. 13.5	Luzcon d. 7.5
Salrot 12	Salrot 11	Salrot 11	Stelae 10.5	Litter 12.5	Pothyp 12	Pothyp 13	Luzcon d. 11.5 Castet d. 14	Luzcon d. 11	Orgcru black 8

A 17.4 **B 12.1**

Barrow 1995
ITEX point-quadrat data
Plot: C 16 Date: August 5, 1995
South half of plot

Salrot 16	Cetcuc 13.5	Salrot d. 13.5	Salrot 13	Castet 13	Castet 13	Cetsp 11	Castet d. 14.5	Castet 11	Salrot 10
Polysp 15.5	Polysp 16	Salrot 18.5	Litter 18	Castet 14 Castet d. 19	Castet 13.5	Castet 12.5	Thasp 12.5	Castet 11.5	Dicsp 9.5
Polysp 16	Polysp 17	Dacarc 16.5	Litter 17	Raclan 16.5	Salrot 16.5	Castet d. 16.5	Litter 17.5	Salrot d. 13	Dacarc 9.5
Thasp 21.5	Castet 17.5	Luzcon d. 12 Castet d. 16	Luzcon d. 15	Alenig 15	**Tag** 16	Litter 16.5	Castet 13.5	Alenig 12	Poaarc 10
Litter 22	Salrot 18	Luzcon d. 14	Thasp 14	Alenig 13.5	Castet d. 15	Castet 13	Cetsp 13	**Tag** 11.5	Raclan d. 12

Barrow 1995
ITEX point-quadrat data
Plot: C 17 Date: July 22, 1995
North half of plot

C 10.6 **D 7.2**

Contet 11	**Tag** 13	Litter 13	Cetcuc 13	Sphglo 12.5	Saxpun 9	Alenig 9	Poaarc 10.5	Litter 12	Litter 9.5
Salrot 10.5	Saxpun 12.5	Litter 13	Salrot d. 11	Alenig 11.5	Salrot d. 11	Salrot 10.5	Cetcuc 10.5	Stelae d. 11	Cetcuc 10.5
Contet 13	Poaarc d. 14	Salrot 14	Alenig 12.5	Orgcru black 13	Alenig 13	Litter 9.5	Salrot 9.5	Alenig 9.5	Salrot 10
Castet d. 15	Cetsp 16	Castet d. 16	Litter 15	Dicsp? 14	Salrot d. 12.5	Salrot d. 11	Litter 11	Alenig 10.5	Dicsp 10.5
Aultur 15	Dicsp 15	Litter 15	Salrot 13	Sphglo 12.5	Alenig 13	Salrot 11.5	Cetisl 9.5	Litter 9.5	Castet 9

A 16.6 **B 4.8**

Barrow 1995
ITEX point-quadrat data
Plot: C 17 Date: August , 1995
South half of plot

Salrot 15 ---	Dacarc 15 ---	Salrot 12.5 ---	Polalp 12 ---	Cetsp 11 ---	Polsp 11.5 ---	Castet d. 9 ---	Dacarc 7 ---	Litter 9.5 ---	Castet d. 7 ---
Salrot 14.5 ---	Salrot 14.5 ---	Litter 16 ---	Salrot 14.5 ---	Salrot 12.5 ---	Cetsp 10 ---	Stone 8 ---	Alenig 7 ---	? 8 ---	Castet 4 ---
Salrot d. 15 ---	Castet d. 14 ---	Castet 16.5 ---	Castet 15.5 ---	Pelsp? 12 ---	Hepatic 8.5 ---	Castet 6 ---	Alenig 5.5 ---	Castet 4 ---	Castet 5.5 ---
Castet 15 ---	Cetsp 15 ---	**Tag** 18 ---	Pelsp? 17 ---	Litter 15.5 ---	Salrot 6.5 ---	Stelae 4.5 ---	Cetcuc 4 ---	Castet 1.5 ---	Castet 4 ---
Dacarc 16.5 ---	Castet 16.5 ---	Dicsp 19 ---	Alenig 16 ---	Salrot d. 14 ---	Stelae d. 7 --- Dicsp 10	**Tag** 5.5 ---	Castet 3 ---	Alenig 3.5 ---	Castet d. 6 ---

Barrow 1995
ITEX point-quadrat data
Plot: C 18 Date: July 22, 1995
North half of plot

C 10.4 **D 9.6**

Orgcru grey 13 ---	Salrot 13 ---	Orgcru white 12 ---	Orgcru white 12 ---	**Tag** 12.5 ---	Salrot 12 ---	Litter 16 ---	Castet 14.5 ---	Stelae d. 13 ---	Luzcon d. 11 ---
Salrot 13.5 ---	Salrot 12.5 ---	**Tag** 12 ---	Orgcru white 12 ---	Orgcru white 12 ---	Salrot 11 ---	Castet 13 --- ? 14.5	Castet d. 16 ---	Luzcon 11.5 ---	Raclan 9.5 ---
Castet 12 ---	Dacarc 13 ---	Alenig 12 ---	Litter 12.5 ---	Salrot 12 ---	Saxpun 13 ---	Poaarc 14 ---	Castet 15.5 ---	Cetsp 15.5 ---	Salrot 12 ---
Cetsp 14 ---	Dacarc 13 ---	Luzcon d. 12 ---	Castet 11 ---	Raclan 13.5 ---	Orgcru white 14 ---	Thasp 15 ---	Caribou 16 ---	Cetcuc 15 ---	Litter 15.5 ---
Salrot 15.5 ---	Poaarc d. 14 ---	Cetcuc 14 ---	Luzcon d. 13 ---	Caribou 14.5 ---	Cetisl 14 ---	Dacarc 14 ---	Castet d. 13.5 ---	Luzcon d. 11 ---	Litter 8.5 ---

A 9.2 **B 6.7**

Barrow 1995
ITEX point-quadrat data
Plot: C 18 Date: July 22, 1995
South half of plot

Litter 17.5	Caribou 15.5	Castet d. 16	Castet 13	Castet d. 14.5	Castet 12	Castet 10	Castet 9	Orgcru black 7	Lichen 7
Litter 16.5	Cetsp 15	Alenig 14.5	Litter 17	Alenig 13.5	Castet 8 Cetcuc 12.5	Castet 8.5	Timaus 7	Stelae 5.5	Raclan 5
Alenig 13.5	Alenig 13.5	Castet d. 14.5	Thasp 14	Litter 11.5	Stelae d. 6.5 Litter 9	Litter 7.5	**Tag** 6	Orgcru white 7	Arclat 3 Timaus 6.5
Orgcru black 12.5	Castet 12	Castet 12	Litter 13	Orgcru black 10	Orgcru white 8	Orgcru black 5.5	Alenig 6	Litter 7.5	Salrot 7.5
Salrot 11	**Tag** 11	Castet d. 13	Salrot 11	Alenig 9	Salrot 7	Litter 7	Alenig 6.5	Litter 8.5	Stone 8

Barrow 1995
ITEX point-quadrat data
Plot: C 19 Date: July 22, 1995
North half of plot

C 18.4 **D 11.7**

Sphglo 20	**Tag** 20	Litter 20	Litter 19	Thasp 19	Dacarc 18.5	Stesp 18.5	Dacarc 17	Castet 13.5	Castet 11.5
Sphglo 19.5	Litter 20.5	Litter 20.5	Hylspl 18	Hylspl 18	Alenig 15.5	Luzcon 16	Salrot 13.5	Castet d. 12.5	Litter 11.5
Orgcru white 20	Alenig 18.5	Sphglo 19	Alenig 15.5	Salrot d. 15	Thasp 14	Cetcuc 14	Castet 10	Luzcon 8.5 Castet 9.5	Castet d. 9.5
Pothyp 19	Litter 18	Raclan 15	Salrot 14	Lichen 13	Sphglo 13	Alenig 13.5	Castet 10	Luzcon 8.5 Litter 10.5	Castet 9
Salrot 18	Luzcon d. 14.5	Litter 14	Cetcuc 14	Alenig 13	Thasp 14	Salrot 13.5	Castet 12	Castet d. 12	Castet 11.5

A 19.5 **B 15.6**

Barrow 1995
ITEX point-quadrat data
Plot: C 19 Date: July 22, 1995
South half of plot

Salrot 17 ---	Pohsp 15.5 ---	Pohsp 14.5 ---	Lichen 14.5 ---	Alenig 14 ---	Salrot d. 15 ---	Salrot d. 14.5 ---	Castet 12 ---	Castet 10.5 ---	Luzcon 8.5 --- Castet 12
Pothyp 17 ---	Pohsp 16 ---	Luzcon 14.5 ---	Lichen 15 ---	Salrot 14 ---	Salrot 15 ---	Litter 15.5 ---	Dacarc 17 ---	Lichen 15.5 ---	Luzcon 11 --- Castet 13.5
Salrot 19 ---	Salrot 16.5 ---	Salrot 16 ---	Salrot d. 14.5 ---	Salrot 14 ---	Castet 14 ---	Litter 15.5 ---	Thasp 18 ---	Dacarc 17 ---	Alenig 16 ---
Salrot 19.5 ---	Litter 21.5 ---	Salrot 20 --- Litter 21.5	Salrot 16 ---	Litter 18.5 ---	Castet 16 ---	Alenig 17.5 ---	**Tag** 18 ---	Dacarc 17 ---	Castet 16 ---
Pol?alp 20 ---	**Tag** 22 ---	Salrot 22 ---	Litter 22 ---	Castet 18 ---	Castet 18 ---	Salrot 19 ---	Litter 19 ---	Litter 19.5 ---	Raclan d. 19 ---

Barrow 1995
ITEX point-quadrat data
Plot: C 20 Date: July 26, 1995
North half of plot

C 17.0 **D 14.4**

Timast 17	Pohsp 17.5	Stelae 16	Alenig 15	Salrot 15.5	Brysp? d. 14.5	Salrot 14.5	Litter 15	Salrot 15.5	Salrot 15.5
Salrot 15	Salrot 15	Salrot 15	Timast 16	Litter 15.5	Salrot d. 14	Orgcru grey 14	Alenig 14.5	Salrot 14	Salrot 15
Salrot 14.5	**Tag** 15	Salrot 14.5	Salrot 14.5	Salrot 14.5	Litter 14.5	Salrot 14	Thasp 13.5	Salrot 14	Salrot d. 15
Orgcru white 15.5	Salrot 14	Dicsp 14	Stelae 12.5	Orgcru white 13.5	Cetcuc 13.5	Pelsp? 14	Salrot 13	Salrot d. 13	Salrot 14
Orgcru white 15.5	Salrot 15	Pothyp 14.5	Pothyp d. 13	Orgcru grey 13.5	Cetcuc 13	Castet 12	Castet 13	Litter 14	Salrot d. 14

A 22.4 **B 12.7**

Barrow 1995
ITEX point-quadrat data
Plot: C 20 Date: July 26, 1995
South half of plot

Lichen 20	Polysp 17.5	Vacvit 15.5	Pohsp 14	Vacvit 13.5	Castet 11 Salrot 13	Castet d. 15	Litter 14	**Tag** 13.5	Salrot 14
Oncwah 22	Alenig 18.5	Polysp d. 18	Salrot 15.5	Salrot 14	Salrot 13	Castet d. 13	Castet d. 14	Thasp 15	Alenig 14.5
Polysp 20.5	**Tag** 19.5	Aultur 20	Salrot 20.5	Salrot 19	Salrot 17.5	Castet d. 13.5	Castet d. 14.5	Poaarc 15	Thasp 16
Luzcon d. 19.5 Aultur 21.5	Cetcuc 18.5	Litter 19	Cetcuc 20.5	Pothyp 20.5	Cetcuc 19.5	Litter 20.5	Castet 14 Alenig 18.5	Dacarc 18	Cetsp 15.5
Cetcuc 21.5	Luzcon d. 19	Pothyp 18	Salrot d. 18	Raclan 17.5	Hylspl 18	Hylspl 16.5	Hylspl 17	Castet 16	Castet 14

Barrow 1995
ITEX point-quadrat data
Plot: C 21 Date: July 22, 1995
North half of plot

C 16.8 **D 8.0**

Dacarc 20.5 ---	Cetcuc 20.5 ---	Luzcon 14.5 --- Castet d. 18	Pelsp 13 ---	Castet 11 ---	Castet 10.5 ---	Castet 12 ---	Castet 11 --- Litter 14	Dacarc 14.5 ---	Salrot 11 ---
Litter 22 ---	Cetcuc 20 ---	Alenig 18 ---	Alenig 11.5 ---	Stelae d. 11.5 ---	**Tag** 12 ---	Castet 10.5 ---	Pelsp 13 ---	Alenig 12.5 ---	Dacarc 10.5 ---
Castet d. 20.5 ---	Timaus 20 ---	Alenig 20.5 ---	Litter 19 ---	Salrot 15 ---	Castet d. 14 ---	Castet 10 ---	Salrot 10 ---	Litter 10.5 ---	Castet 9.5 ---
Litter 22 ---	Cetsp 21 ---	Litter 21 ---	Salrot 17 ---	Litter 18 ---	Salrot 15.5 ---	Castet 11.5 ---	Castet 9.5 ---	Salrot 11 ---	Castet d. 9.5 ---
Cetcuc 22 ---	Cetcuc 20 ---	Castet d. 19 ---	Cetcuc 17 ---	Luzcon d. 15 ---	Castet 14.5 ---	Castet 15 ---	Pothyp 13 ---	Litter 14 ---	Cetsp 10.5 ---

A 20.7 **B 11.9**

Barrow 1995
ITEX point-quadrat data
Plot: C 21 Date: July 22, 1995
South half of plot

Alenig 21.5	Litter 20.5	Thasp 20.5	Stelae d. 16.5	Salrot 15.5	Salrot 15.5	Castet 14	Castet d. 15	Litter 15	Litter 12
Luzcon 21	Thasp 20.5	Poaarc 20.5 Cetsp 22.5	Castet 17	Castet 15.5	Stelae d. 16	Salrot 15	Castet 13	Castet 12	Castet 12.5
Castet d. 24	Castet d. 24	**Tag** 21.5	Cetisl 19.5	Litter 20.5	Dacarc 20	Stelae 16	Salrot 14.5	Castet 10.5	Castet 8.5 Thasp 12.5
Arclat d 23 Salrot 26.5	Salrot 22	Castet d. 20.5	Dacarc 18.5	Arclat d. 16 Dacarc 19	Arclat d. 17.5 Alenig 18	Salrot 17	Stelae d. 13.5	**Tag** 12.5	Alenig 12
Litter 25.5	Arclat d. 19.5 Polstr 24	Salrot 20	Luzcon d. 16 Salrot 19	Salrot 19	Castet d. 18	Salrot 15	Salrot d. 13	Petsp 12	Stesp 13

Barrow 1995
ITEX point-quadrat data
Plot: C 22 Date: July 24, 1995
North half of plot

C 14.4 **D 18.6**

Luzcon d. 18.5	Luzcon d. 18 Salrot d. 20	Salrot 20	Pothyp 17 Pothyp 18.5	Cetcuc 18.5	Sphglo 15.5	Luzcon 14 Caribou 15	Cetsp 15	Salrot d. 15	Dicsp 13.5
Salrot 18.5	Salrot 17.5	Dicsp 17	**Tag** 18	Luzcon d. 15.5 Salrot 17	Salrot 15	Salrot 16	**Tag** 17	Pothyp 14	Salrot 13
Polysp 19.5	Alenig 17	Luzcon d. 17.5 Luzcon 18.5	Dicsp 19	Dicsp 17	Salrot 17.5	Cetsp 18.5	Castet d. 16	Alenig 13.5	Castet 12.5
Alenig 17.5	Stesp 19	Litter 19.5	Raclan d. 19.5	Dicsp 18.5	Stesp 19.5	Dacarc 16.5	Litter 15	Salrot d. 14	Orgcru black 11.5
Sphglo 18.5	Salrot 18	Litter 18.5	Lichen 19	Stesp 20	Thasp 19	Salrot d. 13.5	Salrot d. 12.5	Lichen 10	Hepatic 10

A 18.6 **B 9.9**

Barrow 1995
ITEX point-quadrat data
Plot: C 22 Date: July 205, 1995
South half of plot

Litter 19 ---	??? 21 ---	Salrot 19 ---	Salrot d. 20.5 ---	Alenig 20 ---	Litter 16.5 ---	Stelae 11.5 ---	Salrot d. 11.5 ---	Luzcon d. 8.5 --- Salrot 10.5	Salrot 9 ---
Litter 19.5 ---	Gym?co 18.5 ---	Litter 19.5 ---	Salrot 19 ---	Castet 17 ---	Castet d. 14 ---	Salrot 12 ---	Salrot 10 ---	Salrot 10 ---	Litter 9 ---
Sphglo 19 ---	Brysp 17 ---	Salrot 17.5 ---	Litter 20 ---	Castet 14.5 ---	Alenig 13.5 ---	Lichen 12 ---	Alenig 10.5 ---	**Tag** 9 ---	Salrot 8.5 ---
Alenig 19.5 ---	Salrot d. 18 ---	Thasp 18 ---	Castet 17.5 ---	Castet 15 --- Litter 19	Thasp 14 ---	Luzcon 12 ---	Alenig 12 ---	Orgcru white 12 ---	Orgcru black 9 ---
Salrot 19 ---	Litter 19.5 ---	Castet 17 ---	Pol?alp 18 ---	Thasp 15 ---	Castet 12.5 ---	Alenig 12.5 ---	Salrot 13 ---	Alenig 11 ---	Alenig 9.5 ---

Barrow 1995
ITEX point-quadrat data
Plot: C 23 Date: July 24, 1995
North half of plot

C 13.8 **D 15.1**

Castet d. 16	**Tag** 16	Dicsp d. 15	Alenig 15	Alenig 14.5	Pothyp 15	Pol?alp 15	Castet 14	Castet 13	Castet 16
				Thasp 16				Castet 15	
Castet 14	Cetsp 14	Castet d. 15	Castet 14	Thasp 13.5	Luzcon d. 13.5	Pothyp d. 18	Alenig 16.5	Hepatic 18.5	Litter 15.5
					Thasp 15				
Dacarc 13	Luzcon d. 13	Saxpun 14	Alenig 14	Salrot d. 15	Aultur 18	Thasp 18.5	Alenig 20	Castet 15.5	Alenig 13
Alenig 14	**Tag** 14.5	Castet 12.5	Salrot 14	Alenig 15.5	Alenig 15	Salrot 15.5	Alenig 15.5	Thasp 18	Dicsp 14
		Litter 14							
Alenig 14.5	Alenig 14.5	Alenig 14	Litter 15	Thasp 14.5	Salrot 14.5	Salrot 14	Ana?mi 15.5	Alenig 17	Cetsp 16

A 21.0 **B 14.2**

Barrow 1995
ITEX point-quadrat data
Plot: C 23 Date: July 24, 1995
South half of plot

Salrot 14	Litter 14.5	Alenig 15	Polysp 13.5	Contet 13	Lichen 14	Hepatic 13.5	Salrot d. 13	Castet d. 14	Castet 16
Orgcru grey 16	Pol?alp 16	Orgcru white 14	Poaarc 12	Contet 12.5	Alenig 13	Salrot 12	Castet d. 11.5	Pothyp d. 11	Alenig 13.5
Castet 18	Alenig 16.5	Polysp 13.5	Luzcon d. 11.5	Pelsp d. 12	Stelae d. 13 Polysp 13.5	Bare ground 12.5	Salrot 12.5	Thasp 11.5	Castet 11.5
Castet 22	Alenig 15.5	Alenig 14	Salrot d. 13.5	**Tag** 14	Orgcru white 14.5	Bare ground 14.5	Castet 12	Castet d. 12	Saxpun 11.5
Pothyp 19.5	Cetsp 18	Ochfri 13.5	Bare ground 15	Bare ground 15	Stone 15	Bare ground 13	Bare ground 15.5	Castet d. 14	Castet 12

Barrow 1995
ITEX point-quadrat data
Plot: C 24 Date: July 24, 1995
North half of plot

C 13.8 **D 12.5**

Cetcuc 15.5	Dacarc 16.5	Litter 16	Pelsp 12.5	Salrot 12.5	Orgcru grey 12.5	Orgcru white 14	Orgcru white 12	Pothyp 11	Hepatic 10
Salrot d. 14.5	Salrot 15	Alenig 13	Alenig 13	Timaus d. 13	**Tag** 12.5	Litter 14	Cetcuc 12.5	Salrot 11	Castet 10.5
Contet 14.5	Orgcru grey 13.5	Pelsp 12.5	Pelsp 13	Timaus 14	Orgcru 13.5	**Tag** 14	Alenig 13	Castet d. 12.5	Castet d. 12
Thasp 15	Psohyp d. 14	Luzcon d. 13.5	Salrot 12	Brysp 11.5	Timaus 12	Orgcru white 12.5	Castet 13	Castet 13	Alenig 13
Orgcru white 16	Salrot 15	Salrot d. 14	Thasp 13	Orgcru black 11.5	Orgcru white 12	Polysp 10.5	Orgcru white 11	Orgcru white 11.5	Cetisl 11.5

A 12.7 **B 10.6**

Barrow 1995
ITEX point-quadrat data
Plot: C 24 Date: July 24, 1995
South half of plot

Raclan d. 16 ---	Pothyp 14 --- Litter 15.5	Salrot 14.5 ---	Orgcru 14 ---	Litter 12 ---	Orgcru grey 10.5 ---	Pohsp 11 ---	Pohsp 10.5 ---	Alenig 10 ---	Sphglo 9 ---
Alenig 17 ---	Salrot d. 15 ---	Bryum? 14 ---	Salrot d. 15.5 ---	Orgcru white 14 ---	Salrot 11 ---	Dicsp? 9.5 ---	Salrot 10.5 ---	Litter 12 ---	Litter 11 ---
Salrot 15 ---	Cetsp 14 ---	**Tag** 14 ---	Litter 16 ---	Dacarc 16.5 ---	Orgcru white 11 ---	Salrot 11 ---	Salrot d. 11 ---	Litter 12 ---	Litter 11 ---
Salrot d. 14.5 ---	Pothyp d. 13 ---	Sphglo 12.5 ---	Litter 15 ---	Litter 15.5 ---	Salrot d. 12 ---	Timaus 11.5 ---	Litter 11.5 ---	Castet d. 9.5 ---	Salrot 10 ---
Stesp 14 ---	Salrot 15 ---	Salrot 14 ---	Sphglo 13.5 ---	Litter 13.5 ---	Pothyp 10.5 --- Litter 12	Alenig 11 ---	Castet 10.5 ---	Castet 9.5 ---	Castet 10 ---

Appendix 13. Cryptogams noted incidentally (field identifications only) by B. Murray at the beach ridge, 18-20 August 1995.

Lichens

ALECTORIA NIGRICANS (Ach.) Nyl.
BRYOCAULON DIVERGENS (Ach.) Kärnefelt
CALOPLACA
Cetraria cucullata (Bellardi) Ach. = Flavocetraria cucullata (Bellardi) Kärnefelt & A.Thell
Cetraria delisei (Bory ex Schaer.) Nyl. = Cetrariella delisei (Bory ex Schaer.) Kärnefelt & A.Thell
CETRARIA ISLANDICA (L.) Ach.
CETRARIA KAMCZATICA Savicz
CETRARIA LAEVIGATA Rass.
Cetraria nivalis (L.) Ach. = Flavocetraria nivalis (L.) Kärnefelt & A.Thell subsp. nivalis
Cetraria richardsonii Hook. = Masonhalea richardsonii (Hook.) Kärnefelt
CETRARIELLA DELISEI (Bory ex Schaer.) Kärnefelt & A.Thell
CLADONIA spp.
Cornicularia divergens Ach. = Bryocaulon divergens (Ach.) Kärnefelt
DACTYLINA ARCTICA (Richardson) Nyl.
DACTYLINA RAMULOSA (Hook.) Tuck.
FLAVOCETRARIA CUCULLATA (Bellardi) Kärnefelt & A.Thell
FLAVOCETRARIA NIVALIS (L.) Kärnefelt & A.Thell subsp. NIVALIS
HYPOGYMNIA SUBOBSCURA (Vain.) Poelt
LOBARIA LINITA (Ach.) Rabenh.
MASONHALEA RICHARDSONII (Hook.) Kärnefelt
NEPHROMA EXPALLIDUM (Nyl.) Nyl.
OCHROLECHIA FRIGIDA (Sw.) Lynge
Parmelia omphalodes (L.) Ach. ssp. glacialis Skult = Parmelia skultii Hale
PARMELIA SKULTII Hale
PELTIGERA cf. CANINA or MEMBRANACEA
PELTIGERA cf.. LEUCOPHLEBIA
PELTIGERA MALACEA (Ach.) Funck
PSOROMA HYPNORUM (Vahl) Gray
RAMALINA ALMQUISTII Vain.
RINODINA
SOLORINA CROCEA (L.) Ach.
SPHAEROPHORUS GLOBOSUS (Huds.) Vain.
STEREOCAULON spp.
STICTA ARCTICA Degel.
THAMNOLIA

Liverworts

DIPLOPHYLLUM sp. (only taxifolium reported from Barrow)
GYMNOMITRION sp. (only coralloides reported from Barrow)
several other leafy hepatics

Mosses

AULACOMNIUM TURGIDUM (Wahlenb.) Schwägr.
BARTRAMIA ITHYPHYLLA Brid.
BRYOERYTHROPHYLLUM RECURVIROSTRE (Hedw.) Chen
CONOSTOMUM TETRAGONUM (Hedw.) Lindb.
DICRANELLA sp.
DICRANUM spp.
DISTICHIUM CAPILLACEUM (Hedw.) Bruch, Schimp. & W.Gümbel
DITRICHUM FLEXICAULE (Schwägr.) Hampe
Drepanocladus uncinatus (Hedw.) Warnst. = Sanionia uncinata Hedw.
HYLOCOMIUM SPLENDENS (Hedw.) Schimp. in Bruch, Schimp. & W.Gümbel
Hylocomium splendens (Hedw.) Schimp. in Bruch, Schimp. & W.Gümbel var. obtusifolium (Geh.) Par. = Hylocomium splendens (Hedw.) Schimp. in Bruch, Schimp. & W.Gümbel
HYPNUM sp.
ONCOPHORUS WAHLENBERGII Brid.
POGONATUM DENTATUM (Brid.) Brid.
POHLIA CRUDA (Hedw.) Lindb.
POHLIA NUTANS (Hedw.) Lindb.
POLYTRICHASTRUM ALPINUM (Hedw.) G.L.Sm. var. ALPINUM
Polytrichastrum alpinum (Hedw.) G.L.Sm. var. septentrionale (Sw.) G.L.Sm. = Polytrichastrum alpinum (Hedw.) G.L.Sm. var. alpinum
POLYTRICHUM HYPERBOREUM R.Br.
POLYTRICHUM cf. JUNIPERINUM
Polytrichum piliferum Hedw. var. hyperboreum (R.Br.) Müll.Hal. = Polytrichum hyperboreum R.Br.
POLYTRICHUM STRICTUM Brid.
RACOMITRIUM LANUGINOSUM (Hedw.) Brid.
RHYTIDIUM RUGOSUM (Hedw.) Kindb.
SANIONIA UNCINATA Hedw.
TIMMIA AUSTRIACA Hedw.
TOMENTYPNUM NITENS (Hedw.) Loeske